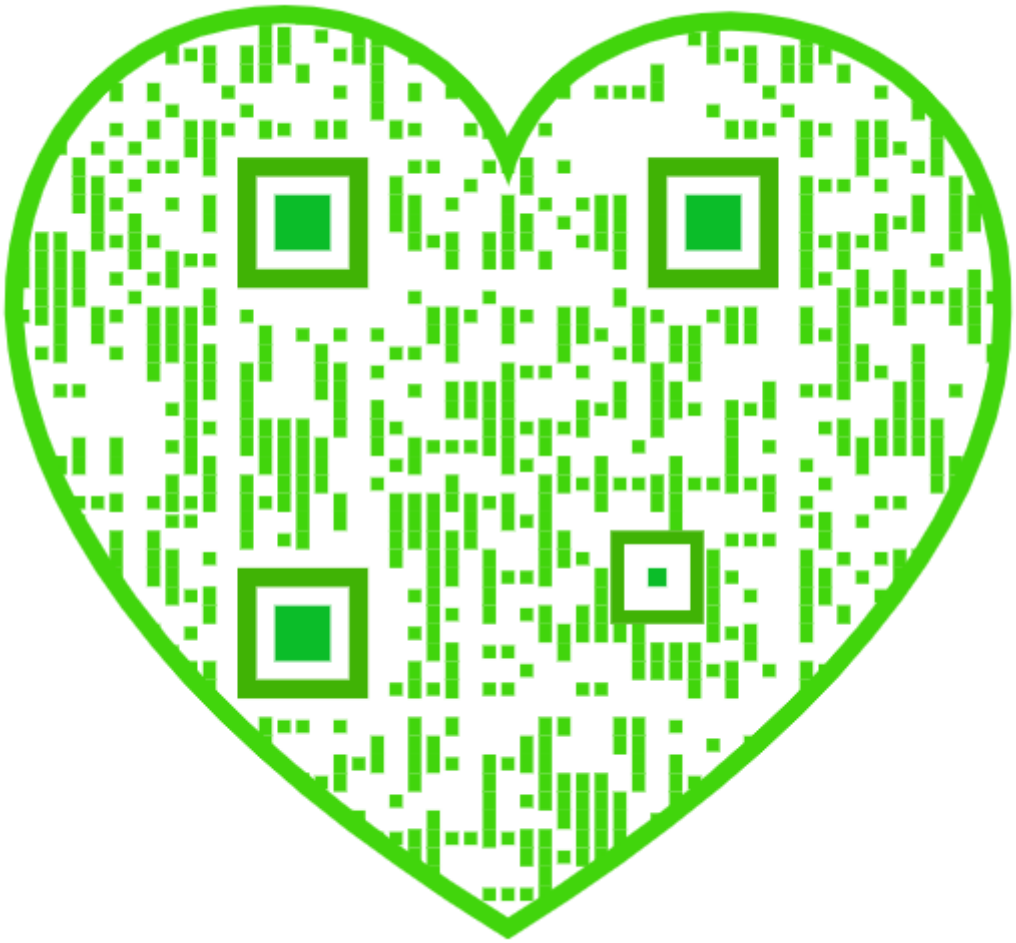

THE AMERICAN

NEW DISPENSATORY.

CONTAINING

GENERAL PRINCIPLES OF PHARMACEUTICK CHEMISTRY.
CHEMICAL ANALYSIS OF THE ARTICLES OF MATERIA MEDICA.
PHARMACEUTICK OPERATIONS.

MATERIA MEDICA, INCLUDING SEVERAL NEW AND VALUABLE ARTICLES, THE PRODUCTION OF THE UNITED STATES.
PREPARATIONS & COMPOSITIONS.

WITH AN APPENDIX,

CONTAINING

AN ACCOUNT OF MINERAL WATERS. MEDICAL PRESCRIPTIONS. THE NATURE AND MEDICAL USES OF THE GASES. MEDICAL ELECTRICITY. GALVANISM. AN ABRIDGMENT OF DR. CURRIE'S REPORTS ON THE USE OF WATER. THE CULTIVATION OF THE POPPY PLANT, AND THE METHOD OF PREPARING OPIUM.

AND SEVERAL USEFUL TABLES.

THE WHOLE COMPILED FROM THE MOST APPROVED AUTHORS, BOTH EUROPEAN AND AMERICAN.

BY JAMES THACHER, M. D.

Fellow of the American Academy of Arts and Sciences, and of the Massachusetts Medical Society, and honorary member of the Georgia Medical Society.

FOURTH EDITION.

305-89

BOSTON:

PUBLISHED BY THOMAS B. WAIT.

Joseph W. Ingraham, Printer.

1821.

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1821

DISTRICT OF MASSACHUSETTS, TO WIT:

DISTRICT CLERK'S OFFICE.

BE it remembered, That on the ninth day of October A. D. 1821, and in the forty-sixth year of the Independence of the United States of America, Thomas B. Wait, of the said district, has deposited in this office the title of a book, the right whereof he claims as proprietor, in the words following, to wit:

"The American New Dispensatory. Containing general principles of pharmaceutick chemistry. Chemical analysis of the articles of materia medica. Pharmaceutick operations. Materia medica, including several new and valuable articles, the production of the United States. Preparations and compositions. With an appendix, containing an account of mineral waters. Medical prescriptions. The nature and medical uses of the gases. Medical electricity. Galvanism. An abridgment of Dr. Currie's reports on the use of water. The cultivation of the poppy plant, and the method of preparing opium. And several useful tables. The whole compiled from the most approved authors, both European and American. By James Thacher, M. D. Fellow of the American Academy of Arts and Sciences, and of the Massachusetts Medical Society, and honorary member of the Georgia Medical Society. Fourth edition."

In conformity to the act of the Congress of the United States, entitled, "An act for the encouragement of learning, by securing the copies of Maps, Charts, and Books, to the authors and proprietors of such copies, during the times therein mentioned;" and also to an act, entitled "An act supplementary to an act, entitled, An act for the encouragement of learning, by securing the copies of Maps, Charts, and Books, to the authors and proprietors of such copies during the times therein mentioned; and extending the benefits thereof to the arts of Designing, Engraving and Etching, Historical, and other Prints."

JNO. W. DAVIS,
Clerk of the District of Massachusetts.

RECOMMENDATIONS.

REPORT OF A COMMITTEE OF THE MASSACHUSETTS MEDICAL SOCIETY.

The Committee appointed by the Massachusetts Medical Society, to examine a manuscript submitted to their inspection by doctor James Thacher, under the title of the American New Dispensatory, have performed that service as minutely as their various avocations would admit; and are of opinion, that a work of this kind is much wanted at the present period, on account of the improvements and important discoveries, which have been made in chemical science within a few years, by which the existing publications have been in some measure superseded.

Dr. Thacher appears to have made his compilation from the most approved modern publications, and to have adapted it to the purpose of "a standard work, exhibiting, in a familiar language, and a concentrated form, the principles of modern pharmacy, chemistry, and materia medica."

Many of the ancient pharmaceutical articles and preparations, which experience has proved to possess little or no value, have been left out of the work, by which means it is compressed into a smaller compass, and rendered less expensive than most European publications of the same kind.

A number of indigenous substances are introduced into the materia medica, which have been hitherto unknown, or which, though their properties are in some instances highly active, have never been brought into general use.

As it appears to have been a principal object of Dr. Thacher to adapt the work to American practice; and as he has adopted for the basis of his work the Pharmacopœia of Massachusetts, lately published by the Medical Society, and recommended for general use, they are of opinion that it will co-operate with the views of the Society in that publication, especially as "its nomenclature and order of arrangement seem to be strictly observed" in the manuscript.

They therefore conclude, that it will be for the interest of medical science in this country, to encourage the work, and that it may be the means of exciting a more general attention to the medicinal virtues of American productions, many of which might be introduced into the materia medica, and advantageously, as well as economically, supply the place of foreign articles.

JOHN WARREN.
AARON DEXTER.
JOSIAH BARTLETT.

Boston, October 14, 1809.

RECOMMENDATIONS DIRECTED TO THE PUBLISHER.

.....

By SAMUEL L. MITCHELL, M.D. F.R.S.E. *Professor of Natural History in the University of New York.*

I formerly expressed a favourable opinion of the American New Dispensatory, by James Thacher, M.D. I retain the same sentiments still. He continues to improve the work from edition to edition.

Besides the judicious selection and arrangement which pervades the book, it is recommended to our countrymen in a special manner by the attention he has paid to the diseases with which they are afflicted, and the indigenous remedies which have been employed for their relief.

Such additions of articles are peculiarly interesting. Our native plants possess virtues which it has been too fashionable to overlook. Of this I am more convinced as my knowledge of them increases. The delineation he has made of them constitutes the most beautiful feature in his picture of the materia medica.

SAMUEL L. MITCHELL.

New York, 19th December, 1817.

By DAVID HOSACK, M.D. F.R.S. *Professor of the Theory and Practice of Physick in the University of New York:* And

By JOHN W. FRANCIS, M.D. *Professor of the Institutes of Medicine.*

The Dispensatory of Dr. Thacher has for some time been before the publick, and the rapid sale it has experienced affords ample evidence of its intrinsick merits. On the *vegetable materia medica* of this country it contains a larger amount of information than any preceding work; and the author has consulted equally his own reputation and the benefit of his readers, in order to render his volume of real practical utility. He has been most assiduous in the collection of his materials, and seldom trusted to the theories of others when unsupported by experience: and while he is parsimonious of opinions, he deals largely in facts. On these, as well as on other accounts, his American Dispensatory will be found a valuable repository of knowledge to the practitioners of the United States. The *third* edition is, with commendable industry, revised and improved.

DAVID HOSACK.

New York, December, 1817. JOHN W. FRANCIS.

By LYMAN SPALDING, M.D. *late President in the University of the State of New York, for the College of Physicians and Surgeons of the Western District.*

I have made The American New Dispensatory, which contains all our well known native medicines, my book of reference since its first publication; because I found it superiour to any European Dispensatory, and a work which would assist in giving us a national character.

New York, December 15, 1817. LYMAN SPALDING.

By WRIGHT POST, M.D. *Professor of Anatomy in the University of New York.*

I have perused with great satisfaction the third edition of Dr. Thacher's Dispensatory, and feel much pleasure in recommending it to publick notice. I cannot but believe that the medical profession in this country will esteem it an acceptable present, and feel under great obligations to the author for the faithful and judicious manner in which the work is executed.

New York, December 22, 1817. WRIGHT POST.

By JOHN R. B. RODGERS, M.D. *late President of New York State Medical Society.*

At your request, I give you, with much pleasure, my opinion of Dr. Thacher's Dispensatory. It is certainly a valuable book, as it exhibits the most important improvements in pharmaceutical chemistry; and with a neat and compendious materia medica, has introduced many of our indigenous productions. The whole work affords much useful information; and is a valuable improvement on what has before been written on that subject.

New York, December 20, 1817. JOHN R. B. RODGERS.

By WILLIAM J. MACNEVEN, M.D. *Professor of Chemistry and Materia Medica in the University of New York.*

The opinion you ask me of Dr. Thacher's New Dispensatory is certainly very favourable to that work. It is compiled with great judgment, and evidently by a person who is not a mere copyist in what he borrows, but who writes on the same subject with others like a person who has the same knowledge in common with them.

New York, December 23, 1817. WILLIAM J. MACNEVEN.

By VALENTINE MOTT, M.D. *Professor of Surgery in the University of New York.*

In Dr. Thacher's Dispensatory is to be found, by far the most considerable effort that has been made to unite, in a systematick form, the American with the European articles of the materia medica. I have perused it with great satisfaction, and can cheerfully recommend it, as well calculated to extend the knowledge of the native plants of our country, that are useful in the treatment of diseases. Dr. T. in my opinion is entitled, and will receive the thanks of the medical publick of America; and his book will pave the way, and facilitate the accomplishment of that much required, and great *national work*, the *American Pharmacopœia.*

New York, December 16, 1817. VALENTINE MOTT.

By JOHN WATTS, Jun. M. D. *late Professor of Medicine in Queen's College.*

For some time past I have been in the habit of referring to the American New Dispensatory, by Dr. Thacher. I was much gratified with the appearance of the third edition of that useful work, and particularly with the alterations and improvements which it contains. I observe that between the first and third editions there is a difference of from one to two hundred pages of valuable matter, making a very important and convenient addition to the size of the work. I have no doubt that the improvements of this edition will contribute greatly to the currency of the book, and reward Dr. Thacher for the pains he has taken to diffuse a knowledge of the subjects of his work.

New York, December 20, 1817. JOHN WATTS, Jun.

By THOMAS COCK, M.D. *late Professor of Anatomy in Queen's College.*

I have, by your request, examined the third edition of Dr. Thacher's Dispensatory; and from the excellence of the work wish you much success in the distribution. The information which it contains, particularly in relation to the materia medica of our own country, must make it a desirable acquisition to every American physician.

From the rapid distribution of former editions, and from the necessity of a Standard Dispensatory of the United States, I do not hesitate in recommending the present work, as one well calculated to bring about this object; and to establish a more uniform, as well as successful mode of prescription among physicians of different parts of the United States.

New York, December 20, 1817. THOMAS COCK.

By JAMES MEASE, M.D. *Lecturer on Pharmacy.*

I have attentively examined Dr. Thacher's Dispensatory, and cheerfully give my opinion as to the great value of the work. The pains he has taken to bring forward the articles of the American materia medica, render it particularly valuable to the practitioners in the United States.

Philadelphia, February 10, 1818. JAMES MEASE.

By J. S. DORSEY, M.D. *Professor of Materia Medica in the University of Pennsylvania.*

My opinion of Thacher's Dispensatory, having been requested, I state with great pleasure that I have frequently had occasion to consult it, and have always derived the requisite information from it. I believe it an excellent work, and well adapted to the present state of medical science in America. The third edition appears to contain some improvements.

Philadelphia, February 11, 1818. J. S. DORSEY.

The work has also been honoured by the express approbation of the late CASPAR WISTAR, M.D. Professor of Anatomy in the University of Philadelphia, and of NATHANIEL CHAPMAN, M.D. Professor of the Institutes and Practice of Physick and of Clinical Practice in the same University. The unexpected death of the former gentleman deprived the publisher of his written recommendation:—that of Dr. Chapman, though obligingly proffered, has not been received.

Boston, April, 1818.

TO

JOHN WARREN, M. D.

PROFESSOR OF ANATOMY AND SURGERY IN THE UNIVERSITY OF CAMBRIDGE, AND PRESIDENT OF THE MASSACHUSETTS MEDICAL SOCIETY.

SIR,

WERE any apology necessary for the liberty I have taken, of inscribing to you the following sheets, without previously soliciting your assent, it might be found in the various relative circumstances, which designate you as the most proper patron of the work. You have been eminently instrumental in the establishment and advancement of the philanthropick institutions over which you preside; while the applause of the publick bears ample attestations to your pre-eminent attainments in medical science, and numerous qualifications as a distinguished teacher of medicine. But, if permitted to indulge, on this occasion, considerations of a more personal nature, I might recur to that interesting period, when, officiating in a military hospital, I experienced from your beneficence, civilities and acts of friendship very propitious at the time; and which, with more recent instances of friendly intercourse, I shall ever recollect with the most pleasing emotions.—Permit me, therefore, to proffer this dedication, as a tribute of respect and gratitude, accompanied with my

fervent wishes, that you may long continue to exhibit to the publick and to your friends those virtues and that benignity, which are conspicuous traits in your character.

It has become one of the felicities of your day to have associated with you as coadjutor a son, whose talents and intelligence have already attracted publick attention, and whose prosperity is peculiarly interesting to yourself.* May this important union, so auspicious to the medical character of our country, with your excellent example and influence, excite emulation in the field of science, and prove a shield to the community against the baneful effects of medical demerit and empiricism.

I am, sir, with sentiments of profound consideration,

Your most obedient servant,

JAMES THACHER.

Plymouth, January 1, 1810.

* John C. Warren, M. D. recently elected adjunct Professor of Anatomy and Surgery.

PREFACE TO THE FOURTH EDITION.

The increasing demand and extensive circulation of this work afford unequivocal proof that the primary object of the undertaking has been in some degree realized. It has ever been the author's solicitude to bestow on each edition such accessions as may appear commensurate with the improvements which are continually occurring relative to this branch of medical science. In this will be found additions and improvements of no inconsiderable importance. By the polite attention of professor Bigelow free access to his very valuable "American Medical Botany" has been permitted, and many articles of the materia medica in this volume are enriched by a portion derived from the labours of that accomplished botanist, which cannot fail of being received with particular interest and favour.

It is in a high degree gratifying to greet the medical publick on the accomplishment and publication of a National Pharmacopœia. This production, so long a desideratum in medical science, reflects honour on our national character, and it will be the standard medium of uniformity in pharmaceutical medicine in the United States. It has ever been considered desirable that a new pharmacopœia should be followed by a corresponding dispensatory, as a conformity in the two is found very convenient in practical medicine. In comparing the present edition with the American Pharmacopœia they will be found in the nomenclature and general principles strictly conformable, although any infringement of the copyright privilege has been scrupulously avoided. It is in a few particulars of minor import only that any difference is ob-

servable, and the two productions are calculated mutually to co-operate in promoting the desirable improvements in the science of medicine. No less than seventeen new articles are introduced into this edition and many others are considerably improved. Considering the prussick acid among the most important of the new articles no effort has been spared to ascertain its real properties, and justly to appreciate its merit.

Note. The author of the American Dispensatory printed at Philadelphia, has conferred an honour on this work by transferring literally from the two last editions more than forty pages into the fourth edition of his own. As the several portions of the transcript which originated with myself are not designated by the customary marks of quotation, nor any reference to the source from whence derived, no apology for this note will be deemed requisite.

Plymouth, Mass. June 1, 1821.

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INTRODUCTION.

MATERIA MEDICA, understood according to the strict definition of the term, is that department of the science of medicine which relates to the knowledge of remedies, or of the effects produced in the human system by such substances as are employed for the removal of disease. The OBJECTS to be attended to in its study are the natural history, the chemical composition and properties, and the medicinal powers and applications of the substances which belong to it.

The NATURAL HISTORY of these substances is of utility in furnishing appropriate characters by which they may be distinguished. Many of them bear a close resemblance to each other, and can only be discriminated by those minute and accurate distinctions which the methods of natural history afford.

From the intimate connexion which frequently subsists between those properties on which natural classification is established, and the various qualities with which bodies are endowed, natural history is likewise, to a certain extent, capable of affording indications of the virtues of remedies. Thus, in the vegetable kingdom, the different species of the same genus, and even the different genera of the same natural order, are composed of substances which frequently exert the same actions on the living system; yet to this connexion there are exceptions so numerous and important, that it is incapable of just application to any considerable extent; it can only suggest conjectures, which require to be brought to the test of experiment.

The more full description of the sensible properties of the articles of the materia medica, affords the most obvious method of distinguishing them, and in many cases the easiest and most certain criterion of their purity and perfection.

It has likewise been imagined, that the sensible qualities of medicines afford indications of their peculiar powers. Those, for example, which are inodorous and insipid, are seldom active remedies; and those which have a similarity in taste or in flavour, have also a general resemblance in their virtues. But though indications of this kind may be partially true, they are extremely limited in their application, and are liable to many causes of obscurity and errour.

The CHEMICAL HISTORY of the articles of the materia medica, embraces several important subjects of inquiry.

Their analysis, especially that of those belonging to the vegetable kingdom, has been supposed capable of leading to a knowledge of their virtues; and the opinion does not *a priori* appear improbable, since the medicinal powers of any compound body, in common with its other internal properties, must arise from its peculiar composition. Without any reference, however, to the very imperfect analyses of the older chemists, it may be remarked, that even from the researches of modern chemistry little information of this kind can be acquired. It may be discovered, indeed, in what proximate principle of any vegetable substance its virtues reside; but this affords no previous indication of these virtues. Nor can the analysis of these principles explain the source of the powers which are attached to them in particular substances; the peculiarities of composition from which these may originate, being by far too subtile to be detected by chemical means.

Chemistry, however, is in other respects more directly useful in its application to the materia medica. It enables us, by the use of proper solvents, or by the due application of heat, to separate those proximate principles of vegetables in which their virtues reside, from other inert or noxious matter with which they may be mixed; it ascertains how far these processes are useful, points out those changes in composition by which the virtues of the substances acted on are frequently altered, and the means by which such injuries may be lessened or prevented. Similar advantages are obtained from its application to the few products of the animal kingdom that are used in medicine. Those which are derived from the mineral kingdom, can be employed with advantage and discrimination only when their composition is known; and the analyses of these substances have exploded many errours respecting them, have enabled us to distinguish them from each other, have pointed out the identity of others, and have rectified the processes by which they are prepared.

By new combinations, chemistry furnishes us with many remedies equally active and important with those afforded by nature; and by pointing out the mutual chemical action of different substances, it guards against the errours which might arise from improper mixtures.

THE

AMERICAN NEW DISPENSATORY.

PART I.

OF THE GENERAL PRINCIPLES OF PHARMACEUTICK CHEMISTRY.

PHARMACEUTICK Chemistry is that branch of chemical science which investigates the composition of bodies, and considers their mutual chemical relations, so far as these are connected with their medicinal properties and applications. It connects the doctrines of Materia Medica and Pharmacy, and forms a proper introduction to the study of each; an exposition of its principles being necessary in delivering the history of the articles of the Materia Medica, and being not less indispensable in explaining the operations of Pharmacy. It includes two subjects, *first*, the analysis of bodies, so far as relates to the enumeration of their constituent principles; and *secondly*, the general operations to which they are subjected in their preparation as remedies.

SECTION I.

Of the Chemical Analysis of the Articles of the Materia Medica.

THE ultimate object of chemical investigations is to discover the composition of bodies; and the result of these investigations is the reducing them into two classes, those which are simple and those which are compound. The

former are such as consist of parts perfectly alike; the most minute particles into which a simple body can be resolved, retaining all its essential properties, and being similar to each other. Compound substances can, on the contrary, be resolved into parts different in their qualities from each other, and from the compound which they had formed.

It is from the union of simple substances that compounds are produced. When two simple bodies are placed in contact, under certain circumstances, an attraction is often exerted by the particles of the one to those of the other: they unite and form a compound, having peculiar properties. These compounds are farther capable of combining with other simple bodies, or with each other, which gives rise to a series of bodies still more extensive; and these again are capable of new combinations, or of such intimate mixtures with each other, as to form many peculiar substances. There are thus produced, from a few simple substances, all the products of nature, and all those which are the results of the operations of art.

It is the province of chemistry to trace these combinations; to determine whether bodies are simple or compound; and, if compound, to ascertain the number of their constituent principles, the proportions, and the modes in which they are combined.

The general process by which these objects are attained, is termed, in the language of chemistry, analysis. It is merely the separation of a compound body into its constituent parts, and is effected either by the agency of heat, or by the exertion of a superiour attraction.

The analysis from the application of heat, differs according to the composition of the body analyzed. If a compound, consisting of two simple substances, be exposed to heat, it in many cases happens that the mutual attraction by which its principles were united ceases, and a decomposition or separation of these principles takes place. This is an example of pure analysis; no change being produced, but merely the separation of the component parts of the compound, so that each is obtained in its original state.

An analysis more complicated is that where several substances are combined together, in such a manner that their attractions are reciprocally balanced, and one compound is formed. When a compound of this kind is

exposed to a high temperature, this balance is frequently subverted, and the compound is decomposed. But its constituent principles, instead of passing off pure, enter into new combinations with each other, and form other compounds, each of which may be collected, and in its turn analyzed. It is in this manner that vegetable and animal substances are acted on by heat: the products afforded by their analysis are not such as pre-existed in them, but are compounds formed during the decomposition, from new combinations of their ultimate constituent principles. This is what is named false or complicated analysis.

Chemical analysis is also effected by the exertion of a superiour attraction. If a compound be placed successively with different substances in situations favourable to the operation of chemical action, one or other of these substances may exert a superiour attraction to one or other of its component parts; a decomposition will be produced; and from the products the constituent principles of the compound as well as their proportions may be determined. As compound substances can combine together so as to form a new compound, it is obvious, that this compound may be resolved either into the immediate principles from the union of which it has been formed, or into those of which these consist. It is necessary, therefore, that these should be distinguished. The former are accordingly named the proximate principles of a compound; the latter the ultimate principles. The proximate principles are of course compounds; the ultimate principles are the elements of these compounds; and the results of analysis are extremely different, according as one or other of these is obtained. When by analysis the constituent principles of a body have been obtained, they may often be combined again, so as to reproduce the substance analyzed. This operation is named Chemical Synthesis; and when it can be effected, is the surest proof of the accuracy of the analysis.

In analyzing the various products of nature, we arrive ultimately at substances which we are unable to decompose, and which are therefore regarded as simple. The absolute simplicity of these is not indeed established; for our inability to decompose them may not arise from this, but from the imperfections of our modes of analysis; and it is even probable, that all the substances

which are yet known to us may be compounds, and that a more refined chemistry may discover their composition. Until this be accomplished, however, they are regarded as simple, and they are so with regard at least to our knowledge of them. As the ultimate principles, therefore, of all analysis, they are first to be considered in proceeding to the general analysis of the articles of the Materia Medica.

Of these bodies, oxygen is the most important. There is no simple substance which exerts an attraction to so many others, or which gives rise to such important compounds. With a few exceptions, indeed, all the productions of nature are either capable of combining, or are already combined with this principle; and the development of its agencies constitutes the most extensive and important part of chemical science.

Oxygen always exists in the gaseous state: when it enters indeed into combination with other substances, it often becomes concrete; but its properties are at the same time changed, and its descriptive characters are therefore taken from it as it exists in the aerial form. Like other gases it is invisible and elastick; its specifick gravity is rather greater than that of atmospherick air; it is absorbed by water, but in a very small proportion.

The distinguishing properties of oxygen gas are those of supporting respiration and combustion. An animal lives much longer in this air than it does in any other; and combustion in it is more vivid and durable. It is the only air indeed, which, strictly speaking, can support either of these processes; other aeriform fluids doing so only from the oxygen they contain.

Its capacity of supporting combustion is more particularly to be assumed as its characteristick chemical property; combustion being nothing but the combination of oxygen with combustible bodies, accompanied with the emission of heat and light. It also frequently, however, enters into combination without the phenomena of combustion being apparent, more especially when the absorption of it takes place slowly, or when it is transferred from a compound in which it exists to another substance. The combination of a body with oxygen is termed oxygenation, or oxidation. The products of this combination have either certain common properties, belonging to a class of chemical agents long distinguished by the ap-

pellation of acids; or they are destitute of these properties, and they are then denominated oxides.

Oxygen forms one fourth part of atmospherick air; and it is principally on its agency that the many chemical changes produced in bodies by that air depend.

Combined with another elastick fluid, hydrogen, in the proportion of 85 parts to 15, it forms water, the substance which has the most extensive operation in promoting chemical action by the fluidity it communicates, and which more directly produces many important chemical changes, by affording oxygen to bodies. This element exists as a constituent principle of all acids, and communicates to them their energy of action. It has more lately been established, that it is also an ingredient in the composition of the alkalis and earths, and that it is therefore the principle of alkalinity as well as of acidity.* With all the metals it combines in different proportions, communicating to them a greater susceptibility of chemical action, and greater activity in their relation to the living system; and it exists as a constituent part of nearly all the vegetable and animal products. Hence no principle is more extensively diffused, and none has a more marked influence in the combinations into which it enters.

The elastick fluid which, along with oxygen gas, composes atmospherick air, is named azote or nitrogen. Its chemical agency is less powerful, nor does it possess any very remarkable property by which it can be characterized; hence it is distinguished rather by negative qualities. It is lighter than oxygen gas, is incapable of supporting combustion or respiration, is scarcely sensibly absorbed by water, and is not combustible in the strict sense of the term; for although it combines with oxygen, the combination is not rapid; it does not, after it has commenced, proceed of itself, and is not attended with any sensible emission of heat or light.

Nitrogen gas forms three fourths of atmospherick air, the remaining fourth part being oxygen gas. In more

* "According to this view of the subject, oxygen, like the traveller in the fable, is capable of blowing hot and cold with the same breath! This extraordinary agent is, we see, the principle of acidity as well as of alkalescence! Surely we may be allowed to doubt the possibility of two such opposite effects resulting from one and the same cause."

Coxe's note on alkali. Edin. Ency. Amer. edition.

intimate combination with oxygen, and in that proportion in which they are mutually saturated, it forms a very powerful acid, the nitrick acid; and in lower degrees of oxygenation it forms compound gases which have no acid powers. With hydrogen, and probably a portion of oxygen, it forms ammonia, one of the alkalis; it exists in some vegetable substances, and is a constituent principle of nearly all the varieties of animal matter. This substance had been usually regarded as simple. The recent researches which have arisen from the application of galvanick electricity to chemistry, have established some singular facts with regard to it; whence the conjecture has been formed that it is a compound, and, in particular, that it is connected in chemical constitution with hydrogen: but the subject is still involved in such obscurity as to preclude any certain conclusion.

Atmospherick air, of which oxygen and nitrogen are the essential constituent parts, has merely the aggregate properties of these two gases, their combination being so slight that no new powers are acquired from it; and, as the oxygen is the more energetick ingredient, the chemical agencies of this air depend chiefly on the operation of this principle. It yields oxygen to a number of substances, with more or less rapidity, and thus changes their chemical constitution. It sometimes acts too by communicating humidity; and in a few cases, by affording an elastick fluid, carbonick acid gas, which is diffused through it in small proportion. Its nitrogen exerts no active power, but apparently serves merely to dilute, and thus to moderate the action of the oxygen gas.

Hydrogen is another elastick fluid, which in the system of modern chemistry has been regarded as elementary, and the importance of which, as a principle opposed to oxygen in its chemical powers, recent discoveries appear to establish. In its aerial form, in which form only it can be obtained uncombined, it is the lightest of all the elastick fluids, and the lightest substance therefore whose gravity we can ascertain. It is distinguished farther by its high inflammability; it burns whenever an ignited body is approached to it in contact with atmospherick air, and explodes if previously mixed with the air. The product of its combustion is water, which is therefore considered as a compound of it with oxygen. Combined with nitrogen, it forms ammonia: with the primary

inflammables, sulphur, carbon, and phosphorus, it forms compound gases: it dissolves even some of the metals; and it is an abundant ingredient in vegetable and animal substances.

Water, of which hydrogen is the base, is a substance extremely peculiar in its chemical relations. Its power of combination is extensive, there being few substances on which it does not act, or with which it does not combine; yet in these combinations no energetick action is displayed; it in general scarcely produces any alteration of properties; and hence its most important operation is the communicating that state of fluidity to bodies which is in general necessary to their mutual chemical actions. It is more peculiarly the solvent of all saline substances, and of the greater number of the earths; and it dissolves many of the vegetable and animal products. When it communicates oxygen, it produces more important changes. Several of the metals are slowly oxidated by it; and when they are dissolved by acids, it often acts by affording to them that oxygen which is necessary to the solution. Vegetable and animal substances often suffer chemical changes from the oxygen which water imparts, as well as from the fluidity it communicates favouring the re-action of their constituent parts; and in their decomposition at elevated temperatures, the elements of the water they contain enter into the composition of the products which these decompositions afford.

There are three substances, formerly supposed to be simple, distinguished by the property of inflammability, and hence named simple inflammables, which exist as constituent principles of a number of natural products. These are carbon, sulphur, and phosphorus. Recent discoveries appear to favour the conclusion, that the inflammable matter of each of them has not yet been obtained perfectly pure; but that in the state in which they are presented to us, it is combined with a small portion of oxygen, and perhaps of hydrogen; and some analogies even lead to the conjecture, that the ultimate bases are metallick. In this compound state, however, they are destitute of the metallick splendour, opacity and specifick gravity, and are connected chiefly by the common property of inflammability. When united with oxygen, they form acids.

Carbon. The ultimate base to which the name of car-

bon ought to be appropriated is probably still unknown to us; but there are several substances of which it constitutes the greater part, and of course in which it exists in a state more or less pure. Wood charcoal in burning is almost entirely consumed, forming with the oxygen with which it combines a peculiar elastick fluid, carbonick acid, and leaving only a small residuum of earthy, saline, and metallick substances. As a discriminating appellation of the pure inflammable matter which thus combines with oxygen, the term carbon was introduced, and it denoted therefore simply this matter free from the other substances mixed with it in charcoal, and apparently not essential to its constitution. It was afterwards discovered, that the diamond, which was known to be a combustible body, affords in burning precisely the same product as charcoal, and hence therefore consists of the same inflammable matter. Different opinions were advanced with regard to the difference between charcoal and diamond; but from galvanick experiments it appears, that in charcoal the inflammable base is combined with a little hydrogen, in diamond, with a very minute proportion of oxygen. In the substance named plumbago, it is united with a small quantity of iron; it has not therefore been obtained entirely insulated; but it is to this inflammable base common to all these substances, and composing nearly the whole of their weight, that the term carbon is understood to be appropriated.

Carbon, besides existing as an element in the composition of many mineral substances, is an abundant ingredient in the products of the vegetable and animal systems. Not being volatile, it forms the principal part of the residual mass when these are decomposed by heat; and it is by this decomposition of vegetable matter, especially of the wood of plants, that it is obtained in the form of charcoal. With oxygen, combined in different proportions, it forms two elastick fluids, carbonick oxide, and carbonick acid. With hydrogen and oxygen, in different proportions, it forms various inflammable gases. Alcohol, or pure ardent spirit, which is the product from saccharine matter by fermentation, is a similar compound; and ether, which is formed from alcohol by the action of acids upon it, is of the same composition with a larger proportion of hydrogen. Lastly, this ternary combination of carbon, hydrogen, and oxygen, in various propor-

tions and modes of combination appears to constitute the principal varieties of vegetable matter.

Sulphur is found in nature principally as a constituent part of mineral bodies. It exists combined with many of the metals; and combined with oxygen forming sulphurick acid, it enters into the composition of a number of saline and earthy compounds. It is highly inflammable; in burning it combines with oxygen, principally in that proportion which forms an elastick fluid, highly pungent and suffocating, sulphurous acid. With a larger proportion of oxygen, it forms a dense inodorous liquid acid, sulphurick acid. With hydrogen, it forms an inflammable gas, sulphuretted hydrogen, which exists in nature impregnating water in the sulphurous mineral waters; and this compound, either alone, or with an additional proportion of hydrogen, forming what is named super-sulphuretted hydrogen, enters into combination with alkalis, earths, and metallick oxides, forming several important pharmaceutick preparations. Lastly, sulphur exists as a constituent part of animal substances: hence sulphuretted hydrogen is generally evolved in the decomposition of these by heat or putrefaction: it has also been detected in the composition of a few vegetables. This inflammable substance appears, from galvanick experiments, to consist of a peculiar base, not yet obtained insulated, combined with small proportions of hydrogen and oxygen; and it is probably this base which enters into the preceding combinations.

Phosphorus, like sulphur, is found chiefly as an ingredient of animal matter. Combined with oxygen, in the state of an acid, it also exists in several of the natural compounds of the mineral kingdom. It is of a soft consistence like wax, semi-transparent, and of a white or yellowish colour; it is so highly inflammable that it burns spontaneously when exposed to the air. It combines with two proportions of oxygen, forming two acids, the phosphorus and the phosphorick. With hydrogen it forms a gas highly inflammable; and it unites with sulphur and with the metals. It too contains minute quantities of oxygen and hydrogen, and its simple base is therefore unknown.

The class of *metals* is an extensive one, the substances to which this name is appropriated being numerous, and the number being still farther augmented, if the lately discovered bases of the alkalis and earths are to be re-

garded as metallick.* The physical properties, characteristick of the metals, are opacity, great lustre, density, and tenacity under the two modifications of ductility and malleability. These are possessed in different degrees by the different metals, and if the basis of the alkalis and earths are to be admitted as metals, the property of density cannot be considered as distinctive, as some of these are even lighter than water. With regard to chemical properties, the metals are fusible, in general not volatile except at very intense heats; they are capable of combining with oxygen, with hydrogen, sulphur, carbon, and phosphorus, with each other, and when oxidated are capable of uniting with acids, alkalis, and earths.

Of these combinations, that with oxygen is the most important; and in relation to the object of this outline, the only one requiring any farther observations. This combination is effected in various modes. When heated in contact with the air, they attract its oxygen: if the temperature be very highly elevated, as in that produced in the galvanick circuit, they display during this oxidation the phenomena of combustion; even if the temperature is less elevated, several of them burn more or less rapidly; but the greater number are oxidated more slowly, and without any sensible extrication of light. Several metals are slowly oxidated by water, or by the joint action of air and water at natural temperatures. And all of them can be oxidated by acids, the acid either directly imparting oxygen to the metal, or enabling it to attract this principle from the water which is present.

The compounds of metals with oxygen belong in general to the order of oxides. They are destitute of the physical properties of the metals, and have an earthy like appearance. Two or three metals acquire in their highest state of oxygenation, acid powers.

In combining with oxygen, different metals unite with very different quantities of it. Each of them combines too with different proportions of oxygen, giving rise to the

* "It is probable, that the numerous discoveries of chemistry will render it necessary to alter entirely the present arrangement of the bodies which are the subjects of chemical investigation. Amongst these changes, since the alkalis and earths are found to be metallick, we shall have to divide the class of metals, into metals properly so called, and into those which are capable of acidification or alkalization."

Coxe's note, article alkalis. Edin. Ency. Amer. edition.

production, from the same metal, of oxides having very different properties. These proportions have been supposed to be determinate, but there is every reason to believe that they are not so, except from the operation of external circumstances connected with the oxidation; that the natural tendency of the law regulating these combinations, is to unite the metal with the oxygen, in quantities indefinite, from the *minimum* to the *maximum*, and that uniform and determinate proportions are established in particular cases, only by causes foreign to the reciprocal attraction whence the combination results,—a circumstance of much importance, as is to be afterwards pointed out, with regard to the pharmaceutical processes on the metals.

When the metals are combined with oxygen, they become capable of combining with the acids, and they then acquire greater activity and power of chemical action. This previous oxidation of a metal is always necessary to its combination with an acid; and hence, when acids act on metals, they first impart to them oxygen, or enable them to attract oxygen from the water, or sometimes from the air, and then combine with the oxide that is formed. As the same metal is capable of existing in different states of oxidation, so by combining in these states with the same acid it forms very different compounds; and these compounds are farther diversified by the different proportions of acid combined in them. Metals are rendered active on the living system, principally by being thus combined with oxygen, or farther combined with acids. In their metallick state, they seldom produce any sensible effect; and any effect they do produce appears to arise from their being chemically acted on by the gastrick fluids. When oxidated, they become much more active; and still more so when the oxide is combined with an acid. And even the degree of oxygenation considerably influences their powers; so that from the same metal preparations of very different degrees of medicinal activity may be obtained, though all agreeing in the kind of action they exert.

It would be foreign to the object of this sketch to give the description of the individual metals: it is sufficient to have stated with regard to them these general facts. Few of them exist as common ingredients in the composition of natural substances, with the exception of iron.

A class of substances, possessing certain common properties, the ultimate principles of the various compounds, not metallick or inflammable, which occur in the mineral kingdom, had been distinguished by the appellation of *Earths*. An analogy had often been observed to exist between these substances and metallick oxides; and the conjecture had even been advanced, that they are of similar constitution, or consist of metallick bases combined with oxygen. By a train of investigation, originating in very different analogies, the composition of the earths has been established, and their bases discovered to be substances previously unknown, and possessing general properties, so nearly allied to those of metals, as to be sufficient perhaps to justify the placing them in that class; yet still so far different as to afford some reason for regarding them at least as a peculiar order.

The Primary or Simple Earths, as they are named, to distinguish them from the various earthy aggregates which exist in nature, have been described as substances insipid, insoluble in water, fixed, and nearly infusible by heat, uninflammable, and capable of combining with acids, so as to neutralize the acid properties. All these characters are not equally appropriate; for there are several of the earths which have a pungent taste, and are soluble in water to a considerable extent, and all of them may be fused by very intense heats.

The principal earths are Silex, Argil, Magnesia, Lime, Barytes, and Strontites; Zircon, Glucine and Ittria, having more doubtful claims to be ranked in this class, or existing in such minute quantities as to be comparatively unimportant.

Silex is an abundant ingredient, not only in mineral substances, but is frequently contained in vegetable products, and forms part of the earthy residuum of their decomposition. It is tasteless, nearly infusible and insoluble in water, and is peculiarly distinguished by its inertness, and comparatively limited range of combination; among the acids it combines only with the fluorick, and even scarcely neutralizes its properties. It unites with the fixed alkalis, and by fusion with the other earths and the metallick oxides.

Argil is insipid, soft to the touch, infusible, insoluble in water, and particularly distinguished by forming with that fluid a ductile plastick mass, which hardens and con-

tracts considerably when heated. With the acids it forms compounds, which have generally a sweetish styptick taste, and which possess, to a certain extent, the property of astringency.

Magnesia exists in the form of a very light white powder, smooth and impalpable; infusible, insoluble in water, and not forming with it a coherent paste; it has a slightly bitter taste, changes the more delicate vegetable blue colours to a green, and combines with acids, forming compounds, in general very soluble, and having a bitter taste. In its pure form it is medicinally employed as an antacid, and its saline compounds have in general a cathartick power.

Lime, or calcareous earth, displays still greater energy of action. It is so far soluble in water, as to communicate to the solution a very harsh styptick taste, and the power of changing the vegetable colours to a green. Being usually obtained by the decomposition of limestone, chalk, or marble, by heat, it is in the form of a hard mass; but when it imbibes water, either directly or from exposure to the atmosphere, it splits, and falls down into a white powder perfectly dry. It is infusible. Combined with the acids, it neutralizes their properties. Its action is considerable on the animal system. Directly applied to animal matter, it acts chemically, producing decomposition, and thus operating as an escharotick. Given in solution, it exerts an astringent and tonick power, which power is also displayed in several of its saline combinations; and by its chemical agency it acts as an antacid, and as has been supposed, likewise as a lithontriptick. Its base has been obtained, though not perhaps perfectly insulated; it has the metallick lustre, and appears to be highly inflammable.

Barytes surpasses lime in energy of chemical action. Like it, when in a solid mass, it absorbs water rapidly, and falls into a dry white powder; its taste is harsh and caustick: when water is combined with it, it fuses by a heat comparatively moderate; but when this is dissipated, the heat requires to be raised to a much higher point. It is more soluble in water than any of the earths, cold water dissolving a twenty-fifth of its weight, and boiling water even more than half its weight; this latter solution depositing, as it cools, transparent prismatick crystals. Its solution changes the vegetable colours to a green.

This earth combines with the acids, and appears to exert to them very powerful attractions, as it decomposes their compounds with the other earths and the alkalis,—a circumstance probably owing, however, rather to the insolubility of the compounds it forms, than to any superiour force of attraction. It exerts affinities to the other earths, and combines also with sulphur and phosphorus. Of all the earths, it is the one which acts most powerfully on the living system. Even in small quantities, it occasions unpleasant symptoms, and its preparations prove poisonous to animals. From this quality, and from another, the great specifick gravity of several of its saline combinations, particularly the native sulphate and carbonate, barytes was often more peculiarly supposed to be of a metallick nature. Its decomposition has been effected by the application of galvanism, and a base obtained from it, of a metallick appearance, having the colour of silver, considerably heavier than water, fusible at a heat below redness, not volatile, inflammable, and reproducing barytes when combined with oxygen.

Strontites, the last of these earths, bears a close resemblance to barytes in many of its properties. Like it, it has a pungent acrid taste, is soluble in water, crytallizable from its saturated solution by cooling, changes the vegetable colours to a green, combines with acids, and decomposes a number of the compounds which they form with the other alkalis and earths. Its native compounds too have a considerable specifick gravity. It is, however, much less soluble in water than barytes; it requires nearly 200 parts of cold water to dissolve it, though boiling water dissolves it in much larger quantity. Barytes decomposes its salts. It is not poisonous; nor does it appear to exert any marked action on the living system. A characteristick property of it is that of its salts causing inflammable bodies to burn with a blood red flame.

Following the series from the metallick oxides through the earths, we arrive at the *Alkalis*. These possess the chemical property common to the whole, and most characteristick, that of combining with acids, neutralizing the acid properties, and forming compounds, analogous in general properties to those formed by the earths and metallick oxides with the acids. But they display still more energy in their chemical actions than the earths, and are

more remote in their qualities, from the oxides of the common metals. Their taste is extremely harsh and acrid; they are highly caustick, abundantly soluble in water; exerting indeed such an attraction to it as to imbibe it from the atmosphere, or attract it from other bodies: they are fusible by a moderate heat, and by a stronger heat are volatilized; they change the vegetable blue and purple colours to a green, the yellow to a brown, and they combine with oils, rendering them diffusible or soluble in water. These properties belong to two of the alkalis which are naturally concrete, potash and soda. A third, ammonia, exists when uncombined as a permanent gas, but it is instantly condensed by water, and absorbed by it in large quantity, and the general properties of it not connected with its peculiar form are the same.

One of the most splendid discoveries of modern chemistry is that of the composition of the alkalis. Ammonia had been known to be formed from the combination of hydrogen with nitrogen, and analogy suggested to chemists the conclusion, that the two fixed alkalis are of similar constitution, containing either of these elements as a common principle; and thus led them aside from the analogy suggested by their connexion with the metallick oxides in neutralizing the acid properties, from which it might have been inferred, that they and the earths are compounds of metals with oxygen. Mr. Davy, availing himself of the powerful instrument of chemical analysis which galvanism affords, submitted potash and soda to its action, and succeeded in effecting their decomposition. Their bases are substances extremely peculiar; they have the metallick lustre, opacity and tenacity, but not the property formerly considered as characteristick of metals, that of great specifick gravity, as they are even lighter than water; they are very fusible and volatile, and pass through these changes of form, as well as different states of cohesion, in a very limited range of temperature; they are also highly inflammable; combined with oxygen, they form these alkalis; and, if these bases are to be admitted as metallick, the analogy in chemical constitution is established between the alkalis, earths and metallick oxides.

Potash, or, as it ought to be named, (in conformity to the rule of giving a similar termination to the names of substances belonging to the same order,) potassa, is obtained from the incineration of vegetables, especially from the

wood; the saline matter remaining after the wood has been burnt, consists principally of this alkali, in combination with carbonick acid, being freed from the impurities by lixiviation. This acid is abstracted by the action of lime, the alkali is obtained in solution, and, by evaporation, can be obtained in a solid state. It is of a white colour, crystallizable, fusible, and volatile at a higher heat; abundantly soluble in water, soluble also in alcohol, powerfully caustick, and possessed of all the alkaline properties in a high degree. There is some uncertainty, whether it exist in the vegetable matter from which it is procured in the state in which it is obtained, or whether its base is a constituent principle of that matter, and is oxygenated during the combustion: one reason for admitting the latter opinion, at least in part, is, that the alkali cannot be extracted in so large a quantity by any other process as by burning.

Potassium, as the base of potash has been named, is at the temperature of 32° a solid substance, hard and brittle, of a white colour, opaque, and with the lustre of polished silver; at 50° it becomes soft and malleable; at 60° it is in the form of small globules, somewhat consistent; at 70 it becomes more mobile and liquid; and at 100, it is completely so. It requires a temperature near to a red heat to volatilize it. It is lighter than water, or even than alcohol or ether. It is highly inflammable, when heated to its vaporifick point, burning with intense heat and vivid light; at lower temperatures it combines more slowly with oxygen; it passes through various stages of oxidation to the maximum, when it forms the alkali, being then combined with oxygen in the proportion of 85 to 15. Such is the strength of its affinity to this principle, that it takes it rapidly from water, and from all the acids. It combines with the primary inflammables, and with the metals.

Soda, or mineral alkali as it has been denominated, in contradistinction to the other alkalis which have been distinguished by the epithet of vegetable, exists as a constituent principle of several saline mineral substances, but it is usually extracted from the combustion of marine plants. It is afforded by the combustion, combined with carbonick acid, and associated with various other saline substances, and is obtained pure by the same general process as that applied to potash. Whether it pre-exists in

sea plants, or whether these, in common with land vegetables, afford potash in burning, which decomposes the muriate of soda with which they are impregnated from their situation, so as to afford soda, has not been well determined. In its physical properties this alkali bears a considerable resemblance to the other. It is solid and white, crystallizable, though with difficulty, from its watery solution; extremely acrid and caustick, fusible and volatile from heat, having a strong attraction to water, changing the vegetable colours to a green, and possessing all the alkaline properties. From potash it is principally distinguished by the very different compounds it forms.

Sodium, the base of soda, is white and opaque, and has the lustre and appearance of silver; is soft and malleable; is somewhat lighter than water; it is less fusible than potassium, not losing its cohesion at a lower temperature than 120°, and requiring for its perfect fusion a heat of 180; it is also less volatile. When heated to ignition, it burns vividly; at lower temperatures it absorbs oxygen without undergoing combustion; it abstracts oxygen from water, and from the acids, frequently with inflammation. It appears to be susceptible of various degrees of oxidation; at the maximum when the proportion of oxygen is about 21 to 79, it forms soda. It acts on the inflammables and the metals nearly as potassium does.

Ammonia. This alkali has usually been denominated volatile, from its volatility compared with the others, even when it is combined with water, being considerable. In its insulated state it exists as a permanently elastick fluid; its odour is extremely pungent; water absorbs it in very large quantity, and this solution forms what is named Liquid Ammonia. Its volatility, or tendency to assume the elastick form, and its comparative dilution, lessen the energy of its action; and hence, though possessed of the general alkaline properties, it appears weaker than the others in the affinities it exerts. Its composition was supposed to have been established; nitrogen and hydrogen appearing, both from analytick and synthetick experiments, to be its constituent principles. When the composition of the fixed alkalis was discovered, and they were proved to be oxides, analogy evidently suggested the conjecture, that oxygen would probably also exist in ammonia; and Mr. Davy, from some experiments, concluded that this

is the case, though these have not been fully confirmed by subsequent experiments. The analogy in the chemical constitution of ammonia to that of the fixed alkalis, has however been established by the important discovery that it affords metallick matter; Berzelius and Pontin, Swedish chemists, having found, that when the alkali is placed at the negative wire in the galvanick circuit in contact with quicksilver, the quicksilver increases in bulk, becomes thick, and at length a soft solid,—changes perfectly similar to what are produced in it by the addition of metallick matter, and which can scarcely be conceived to arise from any other cause. The matter producing these effects in the experiment, must have been derived from decomposition of the ammonia; and it is accordingly found, that when this substance receives oxygen, either from the air or from water, ammonia is reproduced. Either hydrogen or nitrogen must therefore be of a metallick nature, combined probably with a portion of oxygen; and it is not improbable that both these gases may be modifications of the same base. The analogy in constitution has thus been rendered complete, with regard to the three alkalis, and they, as well as the earths, are connected by a series with the oxides of what are more strictly denominated metals,—one of the most perfect examples of generalization which the science of chemistry affords.

The last important class of chemical agents is that of *Acids*. The characteristick acid properties are a sour taste, the power of changing the blue, purple, and green colours of vegetables to a red, and that of combining with the alkalis, earths, and metallick oxides, forming compounds, in which, when the combination is established in the due proportion, the properties of the acid and of the base with which it is united, are equally neutralized. The more powerful acids have a considerable degree of causticity; they have a strong attraction to water, and they act with energy on inflammable and metallick substances. All the acids are compounds of oxygen, and this element is therefore regarded as the principle of acidity. This truth was established by Lavoisier, with regard to a number of the acids, and extended by analogy to a few which had not been decomposed. It has been confirmed, with regard to these, by more recent investigations. The bases of the acids are either inflammable or metallick. The produc-

tion of acidity is usually the result of their full oxygenation, and in some cases the base combines with two proportions of oxygen, forming two acids, different in their properties from each other.

On these facts, with regard to the chemical constitution of the acids, their nomenclature is founded. The base being specifick with regard to each acid, while the oxygen is common to them, it is from the name of the former that the name of the acid is derived; and, by a variation in the termination of this name, the different acids which may be formed from the base, by a difference in the degree of oxygenation, are distinguished; the name terminating in the syllable *ick*, when the acid is that which contains the larger proportion of oxygen, and in the syllable *ous* when it contains the smaller proportion. Thus sulphur forms two acids, by combining with two proportions of oxygen; the term sulphur is the radical whence the names of these are derived, and according to the above principle, the one is denominated the sulphurick, the other the sulphurous acid. Where a large quantity of oxygen can be farther combined with an acid without increasing, but rather diminishing its acid powers, the name is expressed by prefixing the epithet *oxy*, as oxymuriatick acid.

Acids have an extensive power of combination. From the numerous affinities they exert, and from the facility with which they afford oxygen, they are the most active of any of the compound chemical agents, and are hence employed in many pharmaceutick operations. Those of most importance under this view are the sulphurick, nitrick, and muriatick.

The *Sulphurick Acid*, formed from the full oxygenation of sulphur, exists combined with a small quantity of water in the form of a liquid of great density, and from this state of concentration acts powerfully; exerting strong attractions to other bodies; and though, from the strength of affinity between its principles, it does not directly afford oxygen with facility to many substances, it enables them to attract oxygen from water, and thus subjects them to chemical change.

The *Sulphurous Acid*, which is formed from the same base in a lower degree of oxygenation, existing naturally in the elastick form, which is an obstacle to its entering into combination, and not being very largely absorbed

by water, so as to form a concentrated solution, is much weaker.

Nitrick Acid is the result of the full oxygenation of nitrogen; and the oxygen, not being retained in the combination by a strong attraction, the acid yields it readily, and hence acts with more facility and energy on inflammable and metallick substance than any other acid,—oxidating the former, and first oxidating, and then combining with the latter; hence in pharmacy it is used as the most general solvent of the metals. What is named *Nitrous* Acid, is the nitrick, with an impregnation of nitrick oxide gas; it is of a yellow colour, and emits similar coloured dense fumes, while the other is colourless: the chemical agencies of both are nearly the same.

Muriatick Acid exists when uncombined in the aerial form, but it is absorbed in large quantity by water, and forms a liquid acid of considerable strength. Its analysis has not been effected; and even yet, by the action of potassium on it, there have been established only some singular facts, with regard to water combined with it, and the effect of this water on its acidity; the quantity of water in combination with the acid, even in its elastick state, is supposed to amount to at least one third of its weight; and though the acid itself cannot be obtained free from this water, yet when combinations of it with other acids are procured in this state, the acid powers are completely suspended, and are restored on the addition of a little water. This acid, not directly affording oxygen to bodies, oxidates them only by enabling them to attract oxygen from the water it contains; it thus dissolves metals; and it farther combines with other substances, as the alkalis or earths. It is capable of uniting with an additional proportion of oxygen, forming what is named oxymuriatick acid, which, although its acid powers are weaker, imparts oxygen more readily to bodies. And, with a still larger proportion of oxygen, it forms a third acid, hyper-oxymuriatick acid, which gives to the saline compounds in which it exists, the power of acting with much energy on inflammable bodies, in consequence of the very large quantity of oxygen condensed in the combination, and not retained by any great force.

Other acids, less important as pharmaceutick agents, are the Carbonick, Phosphorick, Boracick, and Fluorick.

Carbonick Acid, the product of the complete oxygena-

tion of carbon, existing in the elastick form, and being absorbed by water only in sparing quantity, has no very active chemical power, but is of importance from existing in many natural combinations, particularly of saline and earthy substances belonging to the materia medica. The characters eminently distinguishing it are its only weakening, not entirely neutralizing the properties of the alkalis, when in combination with them, and its being disengaged rapidly with effervescence by other acids from these compounds, and from those it forms with the earths.

Phosphorick Acid has phosphorus for its base, and the affinity between this base and the oxygen, with which it is combined, being strong, it scarcely acts on bodies by oxygenating them, but simply by entering into combination with them; nor are these combinations comparatively of much importance. *Phosphorous Acid*, in which the proportion of oxygen is smaller, is still less important.

Boracick Acid exists in the concrete form, and its chemical action is comparatively weak. So powerful is the affinity between its base and oxygen, that it has only been decomposed by galvanism, or by potassium; and its decomposition, there is reason to conclude, is even not complete: a dark olive coloured substance is obtained, inflammable, and which, by combining with oxygen, reproduces boracick acid; this substance being probably the real base in a lower degree of oxygenation.

Fluorick Acid is elastick, and is not very largely absorbed by water; its chemical action is from these circumstances, therefore, not powerful. It unites, however, easily with the alkalis and earths, and, what peculiarly distinguishes it, is capable of dissolving siliceous earth. It suffers partial decomposition from the action of potassium, oxygen being abstracted from it, and a chocolate coloured substance deposited which burns in oxygen and reproduces the acid.

There is a series of acids with compound bases, derived from the vegetable and animal system; but those of them entitled to notice will be best considered with the classes of substances with which they are more strictly connected. The acids combine with the alkalis, the earths, and the metallick oxides; and when the combination is established in the due proportion, the chemical properties of the acid, and of the base with which it is united, are mutually

neutralized. Hence these compounds are named *neutral salts;* and, as an order of chemical agents, they are distinguished by certain common properties. They can always be obtained in the solid state: they are generally, though not universally, soluble in water; those of them which are soluble, are capable of assuming a crystalline form, the form being very different in different salts. Those which crystallize from their aqueous solution, always retain a quantity of water greater or less in combination, essential to the crystal, and therefore named their water of crystallization. When heated, the increase of temperature is often sufficient to enable this water to dissolve the real saline matter: this is named the watery fusion of salts. As it evaporates, the salt becomes concrete, and, by a farther increase of heat, is either fused or decomposed. The term neutral salt is sometimes restricted to those of which the alkalis are the bases: those formed from the earths are named *earthy salts;* and those from the metallick oxides *metallick salts.* The nomenclature of the whole series is in the modern chemical language simple, and, at the same time, systematick and precise. They are formed into genera and species, according to the acids, and the bases of which they are composed; the name of the genus is derived from that of the acid, the name of the species from that of the base with which the acid is united. Thus all the salts formed from sulphurick acid are considered as constituting one genus, and are named *sulphates;* and the name of each species is expressed, by adding the name of the base, as sulphate of soda, sulphate of lime, sulphate of iron, &c. The acid which sulphur forms in a different degree of oxygenation, the sulphurous, forms a different order of salts; these are named sulphites; and in like manner we have nitrates and nitrites, phosphates and phosphites, &c. Those formed from oxymuriatick acid are named oxy-muriats. Salts are sometimes formed with an excess of acid, or with an excess of base: the acid being considered as the principle forming the genus, these are distinguished by prefixing to the usual name the epithet *super,* when the acid is predominant, and the epithet *sub* when it is deficient, or when the base is in excess, as super-sulphate of potash, sub-carbonate of soda, &c. When an acid is combined in one compound with two bases, as sometimes happens, the names of both bases enter into the name of the salt, as

tartrate of potash and soda. Thus, by this simple system, a facility of nomenclature is afforded; the whole is uniform and systematick, and the memory is aided, by the name pointing out the nature of the salt; and the adoption of this nomenclature in pharmacy is an important improvement.

So far the chemical analysis of unorganized substances connected with the materia medica has been the subject of consideration. It remains to take notice of the analysis of those belonging to the vegetable and animal kingdoms,—a subject of much importance, particularly as it relates to the vegetable part of the materia medica, and which, from this importance, as well as from the nature of the substances themselves, requires to be considered with more minute details.

These two classes of bodies are distinguised by very obvious chemical characters. In unorganized substances, the principles are few, and are combined generally in very simple states of union; their analysis can be executed with accuracy; even the proportions of their principles can be determined with precision, and they can be again combined so as to form the decomposed substance, thus confirming the analysis by synthesis. But, with regard to the products of organization, while the composition, so far as it relates to the ultimate elements, is more uniform, it is with regard to the modes in which they are united much more complicated. They consist of a few common principles; but these, presented to each other in the vessels of the organick being, have been placed under circumstances indefinitely varied, and which art can very imperfectly imitate. Combinations of the same elements are formed, therefore, greatly diversified, and properties are derived from differences of proportions, or modes of union extremely minute. Hence their accurate analysis is executed with difficulty,—a difficulty increased by the circumstance, that these elements having strong mutual affinities, cannot in general be obtained insulated, but when the compound has been decomposed enter into new combinations liable to be modified by slight variations of circumstances; the proportions therefore can seldom be determined with accuracy, the modes of union in general remain unknown, and the confirmation by synthesis is entirely precluded.

Another character distinguishes these two classes. The composition of unorganized bodies being more simple, is not so liable to be subverted; their constituent principles being few, their affinities operate with more force, and the combination is more permanent. That of organized bodies being more complicated has characters precisely the reverse. Composed always of several elements, the affinities are more nicely adjusted, and are therefore more easily modified; and their principles having tendencies to enter into numerous forms of combination, slight variations of circumstances subvert the equilibrium. Hence the susceptibility of decomposition by which they are distinguished: they are liable even to spontaneous changes from the reaction of their elements, and when this is favoured by humidity, elevation of temperature, or the action of the air, new combinations are established, whence the original compounds are decomposed.

From the peculiar constitution of the products of organization, there are two kinds of analysis to which they are subject. The object of the one is to discover their ultimate composition; that of the other is less refined, being confined to the investigation of the proximate principles of which they are composed.

It is seldom that a vegetable substance is homogeneous. The seed, for example, the bark, or the leaves of a plant, is not of one uniform composition, but consists of various proximate principles in a state of mixture, or of slight combination, and capable of being easily separated from each other. Now, these are often connected with their medicinal virtues; the virtue residing perhaps not in the entire substance of the leaf, bark, or seed, but in a principle capable of being separated, and which may frequently be employed in its insulated state. Hence the importance of the analysis of the vegetable substances belonging to the materia medica, so far as relates to their proximate principles; the knowledge it conveys enabling us to employ them with more discrimination, and to submit them to the proper pharmaceutick treatment. An enumeration of their proximate principles, and more particularly of those on which their medicinal powers depend, accordingly always enters into their description as articles of the materia medica. This analysis is executed in various

modes, adapted to particular cases, according to the principles which form the vegetable substance.

An important principle is sometimes separated merely by heat. The temperature cannot indeed be elevated very high, as then the proximate principles of the vegetable would be themselves decomposed, and their elements brought into new combinations. But at heat comparatively moderate, as that of boiling water, this does not happen; and at this temperature several of the principles of plants, such as their essential oil, camphors, and some others not very well defined, are volatilized without decomposition, and of course can be obtained pure.

The action of different solvents is of more extensive use in conducting the vegetable analysis. Water dissolves several of their component principles, such as gum and extractive matter, tannin, saline substances, and some others. These are dissolved in greater or less quantity, and in more or less purity, according to the temperature of the water employed. In general, by raising the water to its boiling point, it is able to dissolve them more completely; but some of them are apt to be volatilized, and others altered in their composition, especially if the atmospherick air is not excluded. Of the substances which the water holds dissolved, part are separated as it cools; the gum can be precipitated by alcohol; the saline substances may be crystallized, or can be discovered by evaporating the solution to dryness, and exposing the mass to such a heat as will destroy the inflammable parts; and tannin is detected by its chemical tests.

Alcohol is another agent of much importance in executing the vegetable analysis. It dissolves the resin, balsam, camphor, and essential oil: these solutions are decomposed by water, each substance being separated, and discernible by its peculiar qualities. Equal parts of alcohol and water, or proof spirit as it is named, is also often employed as a solvent in the analysis of vegetables. Ether dissolves nearly the same principles as alcohol. And the acids, alkalis, and soluble earths, are sometimes of utility as re-agents, in pointing out the existence of peculiar principles.

Lastly, in the analysis of vegetables, we are often able to procure several of their proximate principles, by mechanical means, particularly by expression. Sometimes, too, they exude spontaneously from the growing vegetable,

or are obtained by it from incisions made in the branches or trunk.

After we have discovered the proximate principles of vegetables, the next step is to ascertain their composition. This is an investigation attended, however, with much difficulty, as being liable to all the deceptions arising from a complicated analysis, and incapable of being confirmed by the surer test which synthesis affords.

The composition of these substances with respect to their ultimate principles is nearly uniform. All of them contain carbon and hydrogen, generally if not invariably united with oxygen: some farther contain nitrogen and phosphorus; and in others, several of the metals, particularly iron and manganese, exist. Lime, too, and the two fixed alkalis, either pure, or more commonly in combination with some of the acids, are not unfrequently constituents of vegetable matter. These latter substances, however, are seldom in any considerable proportion; nor in general do they appear to modify much the properties of the substances in which they exist. Nitrogen, and perhaps lime, when present, appear to have the most important influence; and with the exception of the few compounds of which they form a principal part, it may be said, that the vegetable proximate principles consist of carbon, hydrogen and oxygen; the differences in their properties being produced by differences in the proportions of these principles and of the modes in which they are combined.

That a difference in the proportions of these elements may give rise to the differences in the properties of the compounds which they form, cannot be doubted; since in many other cases of chemical combinations, where there is no difficulty in the analysis, differences equally important and well marked are produced by this cause. In vegetable substances we accordingly can often trace this as the cause without being able to point out any other. Thus, fixed and volatile oils have properties in many respects dissimilar: by analysis both are found to consist of carbon and hydrogen, united only in different proportions, the volatile oils having more hydrogen in proportion to the carbon than the fixed have: this is a cause sufficient to account for the difference in their properties; and it accords sufficiently with that difference, for hydrogen being a substance extremely rare and volatile, those compounds in which it predominates, as ether, alcohol,

and others, are in general light and volatile. The greater volatility, therefore, of the essential, compared with the fixed oils, may be ascribed to its predominance.

In other cases, it is probable that the mode in which the constituent principles of these substances are united, is the cause of the difference in their qualities. This is indeed a cause which can be but imperfectly investigated, either by analysis or synthesis; but it is conceivable *a priori*, and sufficiently confirmed by chemical facts, that a difference in the mode of union may give rise to very important diversities of properties. If a compound, for example, consists of three elements, these may be united in two modes. Their attractions may be reciprocally balanced, and they may form what is named, in strict propriety, a ternary combination; or, from a variation in the circumstances under which the union has been effected, two of them may be combined, and the compound thus formed may exert an attraction to the third principle, unite with it, and form a new substance. The compounds resulting from these different modes of combination, though composed of the same principles, united perhaps even in the same proportions, would still have properties different from each other. Still greater diversities will be produced where the elements are more numerous, and the possible modes of union of course more diversified. And when we consider these causes from difference of proportions, and modes of combination, we shall scarcely be surprised at the number of different substances, immense as it is, which nature forms from a few elementary principles.

The proximate principles of vegetables are sometimes analyzed by exposure to heat: their elements enter into new combinations, and from the nature of the products, we discover what the principles were. Thus, if the substance exposed to heat yields a large quantity of acid, we conclude that it contains a considerable quantity of oxygen as a constituent part. If it afford much empyreumatick oil, we infer that it contains a large proportion of hydrogen, this principle being necessary to the constitution of that product. When ammonia or prussick acid is afforded by this kind of analysis, we conclude, for the same reason, that nitrogen has been a constituent principle. And by the same mode are discovered the earths and metals which had been present in it; these remaining after

the volatile parts have been expelled. Lastly, by the quantity of charcoal which remains as a residuum, we can form some conclusion as to the quantity of carbon which the vegetable substance contained. Their analysis is also effected by exposing them to heat with the access of atmospherick air, and collecting the products of the combustion that takes place. From the nature of these products, we can ascertain the proportions in which they were united. Oil, for example, when subjected to this analysis, yields nothing but carbonick acid and water. We conclude therefore that it is composed of carbon and hydrogen, since these principles, united with oxygen, form these products, and since, if any other simple substance had existed in the oil, it would have appeared either pure or in combination with oxygen. We can even determine in this manner the proportion in which the carbon and hydrogen existed in the combination. From knowing what quantity of carbon exists in a given quantity of carbonick acid, and what quantity of hydrogen exists in a given quantity of water, we thus also discover whether any oxygen had existed in the composition of the oil.

They are sometimes analyzed by subjecting them to spontaneous decomposition. It is thus that sugar is brought into the state of fermentation ; and from the products of the fermentation the principles of the saccharine matter are determined.

Lastly, their analysis is sometimes executed by the agency of the nitrick acid, which communicates to them oxygen, and by the product ascertains the nature of their acidifiable base.

Such are the methods by which these principles of vegetable matter are analyzed. It is to be remarked, that the analysis is so difficult, as to afford, even when executed with the greatest care, only approximations ; and as applied to the articles of the materia medica is seldom of utility, since we can scarcely ever discover any relation between the ultimate composition and the medicinal powers of the substance analyzed. These, in common with all its properties, no doubt depend on that composition ; but our modes of analysis are still too limited and imperfect to admit of our tracing the connexion between them. The application of chemistry, therefore, to the vegetable substances belonging to the materia medica, is, as has already been remarked, in a great measure confined to the discrimination of their proximate principles.

The proximate principles of vegetables are numerous, and of very different kinds. They are not all to be met with in every vegetable, or in every period of vegetation: some exist only in certain plants, and that only in their state of vigour and maturity: at other times they are to be found only before they have arrived at that period; some are deposited in particular organs; others are diffused through the whole substance of the vegetable, and mixed in a manner more or less intimate with all its parts: and some are nearly peculiar to certain vegetables, while others are common to almost every plant. Those only require to be pointed out in this sketch, which are particularly connected with medicinal properties.

These principles are the products of vegetation from a common juice or sap, which circulates freely through every part of the vegetable system, being supplied by absorption from the soil, and perhaps from the atmosphere. It varies in its qualities, particularly according to the season, and the progress of the plant to maturity; frequently too it has an intermixture of the proper juices: it always contains the usual elements of vegetable matter, with generally saline substances, having principally lime for their base. By the chemical changes it suffers from the action of the vessels of the plant, aided by the action of the air and of light, its elements pass into various states of combinations, whence the peculiar products of vegetation are formed.

The first transition of the sap appears to be into *mucilage*, or *gum*, one of the proximate principles contained in greatest abundance in vegetables. It is found in all young plants, in greater or less quantity; and is often so abundant in the plant, as to be discharged by spontaneous exudation. It abounds also in their roots, stalks, and leaves, and especially in their seeds. It is an inodorous, insipid, and glutinous substance, soluble in water, in every proportion, and forming with it a thick viscid solution, which by evaporation affords a tenacious mass, that when dried is brittle, and again soluble. It is insoluble in alcohol, ether, or oil, and is precipitated from its solution in water by the addition of alcohol. It does not absorb oxygen from the atmosphere; though its solution becomes sensibly acid by keeping, owing to partial spontaneous decomposition, and the combination of part of the principles of the gum, so as to form acetick

acid. Exposed to heat it is neither fusible nor volatile. At a temperature superiour to 212, but inferiour to that of ignition, it is decomposed; its principles entering into new combinations: the products are an acid liquor consisting principally of acetick acid, carbonick acid, and carburetted hydrogen gases, with a little ammonia, and a residuum of charcoal containing lime, one ounce of gum, affording six grains of lime. This lime is also detected by adding sulphurick acid to a solution of gum. From these products of the analysis, it is evident that the ultimate principles of gum are, oxygen, hydrogen, and carbon, with smaller proportions of nitrogen and lime. Gum is not capable of passing into the vinous fermentation, which appears to be owing to the portion of lime existing in it, as lime has the effect of preventing even sugar from suffering this change.

Gum is not inflammable; for although, when heated, in contact with atmospherick air, it combines with oxygen, it emits no flame. The principal products of this combination are carbonick acid and water. By the action of nitrick acid it is converted into oxalick, malick, and saccholactick acids. Oxymuriatick acid converts it into citrick acid.

Gum is usually obtained either by spontaneous exudation, or by incisions made in the trunks and branches of trees. It is more or less pure as it is obtained from different plants. Its existence in vegetables is detected by boiling gently the vegetable substance with water; the water dissolves the gum, and if much of that principle be present the solution is glutinous. It may be allowed to remain till the impurities have subsided; then be evaporated to the consistence of thin syrups; and the addition of three parts of alcohol will separate the whole of the gum in flakes.

Pure gum is not an active substance, considered with respect to its effects on the living system. In medicine it is only used for its lubricating quality; and so little activity does it exert, that it has often been taken for a considerable time as an article of food. From its chemical properties it is of rather more importance. As a component part of vegetable matter, it renders the other parts more soluble in watery liquors, and may thus favour their action on the stomach. In pharmacy it is used as a medium to combine balsams, resins, and oils, with water.

If a small quantity of any of these substances be triturated with a little gum or mucilage, on the addition of water they remain suspended in it, forming a white milky like mixture, retaining all the properties of the balsam or oil. Though pure gum is thus inactive, yet the virtues of many vegetables depend on a gummy matter.

Fecula is a principle approaching in several of its characters to gum. Like it, it is soluble in hot water, and forms a viscid glutinous solution; but it is at once distinguished by being perfectly insoluble in cold water. It exists principally in the tuberose roots and gramineous seeds. It is extracted by beating the dried root or seed with a large quantity of water; the liquid soon becomes milky, from the diffusion of a white powder through it. On being poured from the remaining vegetable matter, and allowed to remain at rest, this powder is deposited, and when washed and dried is the fecula of the plant. It is generally mild and insipid, of a white colour, with a peculiar kind of brilliancy, soft to the touch; but portions of the other principles of the plant sometimes adhere to it, from which it receives colour, smell, and taste. Starch is the fecula of wheat, and is the most abundant part of that grain.

Fecula is insoluble in alcohol. The action of the acids on it is somewhat analogous to that they exert on gum, dissolving it when they are weak or diluted, but decomposing it when they are more concentrated. The alkalis also dissolve it. Exposed to heat, it is charred, and suffers decomposition, affording products which indicate carbon, hydrogen, and oxygen, to be its constituent principles. A property eminently characteristick of it, and probably depending on its composition, is that of being convertible into saccharine matter, and thence ultimately passing into the vinous fermentation,—a property not belonging to gum or any other principle. This conversion takes place in germination, and is accompanied with an absorption of oxygen, and formation of carbonick acid.

Fecula is a substance highly nutritive, and is usually contained in those plants which serve as food. It is sometimes employed in its pure state in medicine, on account of its nutritive quality, and from its being easy of digestion: sago and salop are substances of this kind.

Gluten. This principle is usually associated with fecula, and is obtained in the process in which the fecula is

separated. It then appears as a viscous, elastick, and fibrous like substance, which from its close resemblance to the animal product named gluten, has been denominated vegetable gluten. It is obtained from the flour of wheat in greatest abundance: the flour is made into a paste with water, which being compressed by the hand, while a stream of water falls upon it, the fecula is carried off in the state of powder: the mucilaginous and saccharine parts of the grain are dissolved by the water; and there remains a tenacious ductile mass, forming the gluten: it has scarcely any taste, is of a greyish colour, and when dried is semi-transparent, resembling glue in its appearance: it is insoluble in water, and is dissolved in very small quantity, by alcohol: by the action of nitrous acid, it is converted into oxalick acid, giving out, at the same time, nitrogen gas: decomposed by heat, it affords a large quantity of ammonia, and it is subject like animal matter to putrefaction. It contains a larger proportion of nitrogen than any other vegetable product does, and it is supposed to render those vegetables in which it is present highly nutritive.

Another principle occasionally found in vegetables, but belonging more exclusively to animal substances, is that which has been named *Albumen*, from its resemblance to the animal principle of that name. It is soluble in cold water, its solution being coagulated by heat: it is coagulated also by alcohol, but is dissolved by the alkalis: like gluten it is liable to putrefaction, and furnishes a large quantity of ammonia by distillation. This principle is found in hemlock, scurvy grass, cresses, and several other plants, and is obtained from the fresh expressed juice of the leaves when they are heated nearly to the boiling point; the albuminous matter coagulating, and separating in the form of flakes. A similar separation takes place on the addition of spirit of wine. It is contained also in the seeds of other plants, particularly in the different nutritive grains; in the farina of wheat, for instance, it is found dissolved in the water which is employed in separating the fecula from the gluten. This principle, it may be added, has been regarded, and perhaps justly, as a variety of gluten; it differs little from it in chemical properties; and the peculiar physical qualities supposed to be distinctive of gluten are obviously derived from the process by which it is obtained.

Saccharine Matter. This exists in many vegetable substances, especially in their fruits and roots, but often intimately united with their mucilaginous and extractive matter. When freed from these, its taste is sweet, without any peculiar flavour; it is soluble in water and in alcohol; is capable of crystallizing; its watery solution enters first into the vinous, and then into the acetous fermentation.

By the action of nitrick acid, it is converted into oxalick acid; by decomposition by heat, it affords a large quantity of empyreumatick acetick acid, a small quantity of empyreumatick oil, carbonick acid and carburetted hydrogen gases, the residuum being charcoal. It consists, therefore, of carbon, hydrogen, and oxygen; and from the large quantity of acid which its analysis yields, it appears to contain more oxygen than any other vegetable substance that is not acid.

Sugar appears to be formed from the fecula of the vegetable in which it exists. It contains nearly the same principles as it does, and the operation of malting throws considerable light on its formation; in this process, the fecula of grain is converted into saccharine matter, oxygen is absorbed, and carbonick acid formed; and this abstraction of carbon, if it constitutes the whole change, of course proves that the sugar, which is the product of the operation, has an increased proportion of hydrogen and oxygen. Saccharine matter has little activity, though there are some varieties of it, in which some weak medicinal powers reside.

Oil is a common proximate principle of vegetable matter; it is of two kinds, expressed or fat oil, and distilled, volatile, or essential oil. These have the common qualities of unctuosity and inflammability; but they also possess peculiar properties, by which they are distinguished as distinct species.

The expressed, fat, or fixed oils are thick and unctuous, insipid and inodorous; they congeal on exposure to cold, are lighter than water, and insoluble in that liquid; they are likewise insoluble, except in very minute quantity, in alcohol, and they combine with the alkalis, forming soap. They are not volatilized at the temperature of 212°: some require to be raised to 600 to make them boil, and the condensed oil is changed in its properties. At a temperature somewhat higher they are decomposed in close

vessels, and burn when the atmospherick air is not excluded. They also slowly absorb oxygen at a low temperature; a small quantity of an acid is formed, which renders them rancid; by longer exposure to the air, they are inspissated, and even become at length concrete. Those oils in particular which have been expressed with the aid of heat, and which are named drying oils, suffer this last change, and are ultimately converted into a resinous matter.

Expressed Oils consist chiefly of carbon and hydrogen, as is established by the products of their decomposition by heat, which are chiefly carburetted hydrogen and carbonick acid. The products of their combustion are water and carbonick acid.

These oils are generally contained in the seeds and fruit of vegetables, and only at the period of their maturity. They are extracted by expression, or by decoction with water; they are frequently impregnated with part of the extractive, mucilaginous or resinous particles which the seed or fruit contains; from which they derive colour, and in many cases peculiar taste and odour, and even perhaps certain medicinal powers. In general, however, they have little activity as medicines. They are mild and emollient, and are used principally for these virtues. They are rendered miscible with water by the medium of gum or sugar, or by the addition of a small quantity of any of the alkalis.

Volatile or essential oils have characteristick properties different from those of the expressed oils. They are volatile at a low temperature, and are entirely and quickly converted into vapour at the heat of boiling water, without being decomposed; they are soluble in a small proportion in water, and hence the impregnation which water receives from many vegetables by distillation. In alcohol, they are completely soluble; but they do not combine with the alkalis with facility; they are in general odoriferous, pungent, and even acrid; they are more highly inflammable than the fixed oils, and by exposure to the atmosphere they slowly absorb oxygen, are thickened and coloured more deeply, lose much of their smell and pungency, and are at length converted into substances of a resinous nature. This change is partly owing to the escape of part of the oil, but principally to the oxygen absorbed combining with part of the hydrogen.

These oils, from their analysis by heat, or by combination, appear to consist principally of carbon and hydrogen. They differ from the fixed oils in containing a larger proportion of hydrogen; hence they are more volatile, and more inflammable, and during their combustion they afford a larger quantity of aqueous vapour.

Volatile oils are less abundant in the products of vegetation than some other principles; they do not exist indeed in any considerable quantity but in the aromatick plants: in some plants, the oil is confined to the flowers, fruit, leaves, or bark; sometimes it is contained in several of these parts, and in a few instances it is found diffused through every part of the plant. The quantity varies, not only according to the age, but also according to the vigour of the plant; hence it is much influenced by climate, soil, and season. It is remarkable, that some of the most odoriferous flowers, as the rose or jessamine, yield scarcely any essential oil, though they lose their flavour by a gentle heat.

Some of these oils, being contained in distinct vesicles, may be obtained by simple pressure. In this manner, essential oils can be obtained from orange or lemon rind. More usually, they are procured by distillation; the vegetable is boiled in water; the essential oil is volatilized with the aqueous vapour; both are condensed in close vessels; the water has the taste and flavour of the plant, from having dissolved a small part of the oil: the greater part of it, however, is collected pure, either swimming on the surface of the water, when the oil is lighter, as is generally the case, or in a few cases, when it is heavier, having fallen to the bottom.

The essential oils of vegetables may be considered as medicines of some activity. They have always the odour and generally the taste of the vegetable from which they are obtained; accompanied with more or less pungency.

Some of them, however, are less pungent and less acrid than the vegetable matter from which they are procured, these qualities residing in the resin, or some of the other proximate principles.

A proximate principle, found in some vegetables similar in many of its properties to essential oil, is *Camphor*. It is a solid substance of a white colour, semitransparent, having a strong peculiar smell, and a penetrating taste; tenacious, and slightly unctuous to the touch. It is very

sparingly soluble in water, but is completely soluble in alcohol, ether, and oils; from these solutions, it is precipitated by the addition of water. It evaporates entirely, though slowly, at the common temperature of the atmosphere; at a higher temperature, in close vessels, it is sublimed without alteration; it is also highly inflammable, the product of the combustion being carbonick acid, and a quantity of what is named camphorick acid. It is acted on by the more powerful acids, sulphurick acid charring it and forming a portion of tannin; nitrick acid dissolving it, and decomposing a portion of it, converting it into an acid; muriatick, fluorick, acetick and carbonick acid dissolving it, without materially changing its composition, as the greater part can be precipitated by water. Nitrick acid, repeatedly distilled from it, converts it into a concrete acid, named camphorick acid, which appears to be different from any known acid.

By particular management, camphor may be decomposed by heat. If it is intimately mixed, with six parts of clay, and made into small balls, by the addition of water, its volatilization is prevented, and, by the heat which may be applied to it, its decomposition is effected. A volatile oil, fragrant and pungent, of a golden yellow colour, amounting to one third of the weight of the camphor, distils over; a quantity of charcoal, about one fourth of the weight of the camphor, remains; the remaining products of the decomposition are carburetted hydrogen, carbonick acid gas, and camphorick acid. From the result of this analysis, camphor appears to differ from the essential oils, principally in containing a much larger proportion of carbon, since, by its decomposition, by heat, it is resolved principally into charcoal, or compounds of carbon, and into an oil, which has all the properties of essential oil, being odorous and pungent, volatile and inflammable, soluble in alcohol, and precipitated from it by the addition of water.

Camphor is found in distinct vessels, in the wood and bark of certain vegetables. It is also contained in many essential oils, as those of lavender, sage, and others, from which it is deposited on long keeping. The curious fact has been established, that it may be artificially formed, this formation of it taking place in the action of muriatick acid on oil of turpentine.

The same relation which camphor bears to the volatile, wax seems to have to the fixed oils. This substance, though formed perhaps by the bee, is also a product of vegetation; it is yielded by the leaves and fruit, and it is sometimes intimately mixed with the resin, gum, or extractive matter of plants. It is insoluble in water, and is soluble in very small quantity with the aid of heat in alcohol. It combines with the fixed alkalis, though with some difficulty. It unites easily with the expressed oils. It melts at a moderate heat. By distillation in close vessels it affords an acid, and a considerable quantity of thick oil, a small quantity of charcoal being the residuum.

Resin. This principle is in some measure connected with essential oil, and in plants is often united with it, as well as with other principles. Some vegetables, however, exude juices which concrete into a matter entirely resinous, and it is from these that the characters of the substances belonging to this genus are taken. The distinguishing properties of a resin are its existing in a solid state, being insoluble in water, but soluble in alcohol, ether, and oils; the solution in ether or alcohol is decomposed by water; resins are in general odorous and sapid, though neither of these qualities is essential to a pure resin; they are inflammable, and burn with much smoke; at a temperature nearly that of boiling water they melt; but they cannot be volatilized without being decomposed. In close vessels the product of their decomposition by heat are water, empyreumatick acetick acid, an empyreumatick oil, and a residuum of charcoal, indicating carbon, hydrogen, and oxygen, to be their ultimate principles. At the common temperature of the atmosphere, they do not combine with oxygen; neither are they acted on by water; the solutions of them in alcohol are therefore employed under the form of varnishes, to preserve other bodies from alteration by exposure to the air. They are dissolved by the fixed alkalis, likewise by some of the acids, especially the acetick: the stronger acids decompose them.

The existence of resin in a vegetable is discovered by infusing it in alcohol; this dissolves the resin, if any is present, and it can then be precipitated from the solution by the addition of water. The method of estimating the quantity of resin in any vegetable is by ascertaining the increase of weight which alcohol acquires from it by

digestion, or the alcohol may be evaporated by a moderate heat, and the resin obtained pure.

Resins are in general more active than gums, with respect to their medicinal powers. The purest resins are indeed nearly inert, but there are many vegetable substances which act powerfully on the system, that appear to consist principally of resinous matter, and it is in this resinous part that their powers reside. The proper solvent or menstruum of resin is alcohol; by this it can be extracted from some of the other constituent parts of vegetables, though there are others which are soluble in the same fluid, and therefore it is difficult to obtain the resin pure. Though resin is insoluble by itself in water, yet part of it can be taken up, and kept suspended by the medium of gum. These two principles are often naturally mixed in vegetables forming what are named gum-resins; and some of the most active articles of the materia medica are natural compositions of this kind. Their properties are derived from the two principles of which they consist: thus, they are only partially soluble either in water or in alcohol; they are soluble in alkaline liquors; they are not fusible by heat, they only soften, and if the heat is raised higher are decomposed, affording a little ammonia with the usual products, probably derived from the gum they contain. The proportions of gum and resin, thus mixed, are in different substances of this family very various; but they are generally such, that a mixture of equal parts of water and alcohol dissolves the gum-resin. This is their proper solvent; it also dissolves some other vegetable principles, particularly extract, and hence it is the menstruum most generally used in Pharmacy to extract the active matter of vegetables.

Balsams are resinous juices, with an intermixture generally of essential oil, and containing always a portion of the acid named Benzoick Acid. They are usually thick and tenacious, becoming by age concrete. They are odorous and pungent, principally from the essential oil they contain.

A principle of considerable importance in its pharmaceutick relations, is what has been named by the French chemists, by whom its characters were first established, Extract, or Extractive Matter, and which is supposed to constitute the active matter of many vegetables. Its leading character is that it is soluble equally in pure

water and in alcohol; and hence a solution of it in the one fluid is not precipitated by the addition of another. By this property, it is distinguished both from gum and resin, the one being insoluble in water, the other in alcohol. The compound of the two, or gum-resin, is indeed partly soluble in either of these fluids, but it never is completely so, since if it contain as much gum as renders it soluble in water, it is only partially dissolved by alcohol; and if it consist principally of resin, so as to be completely dissolved by alcohol, it is imperfectly dissolved by water. If a gum-resin be digested with alcohol, the tincture it affords is decomposed by water, and, *vice versa*, its watery solution is decomposed by alcohol.

There is another character by which extractive matter is distinguished, that of suffering decomposition when exposed in a humid state to the atmospherick air; this takes place even at natural temperatures, and with still more rapidity when the temperature is raised, as when the extractive matter is boiled in water; it then becomes insoluble and comparatively inert. This change, Fourcroy ascribed to the fixation of oxygen. According to T. Saussine, oxygen is indeed absorbed, but carbonick acid is at the same time formed; he supposes too, that part of the oxygen and hydrogen of the extractive matter combine and form water, and that the inert insoluble precipitate has therefore an increased proportion of carbon. It is from this cause apparently that the medicinal powers of many vegetables are injured by decoction in water, with the admission of air, and not, as was at one time believed, from the dissipation of any volatile active principles; many plants indeed which sustain injury from this operation, containing no such principles.

By oxymuriatick acid, extract is converted into a concrete substance of a yellow colour, insoluble in water, probably from a similar change. It exerts affinities to argil and to metallick oxides. By heat it is decomposed, affording empyreumatick oil and acid, with a portion of ammonia; and in this, as well as in its spontaneous decomposition, when the re-action of its elements is favoured by humidity, it leaves as a residuum carbonates of potash and lime.

This principle is supposed to be the base of what are named the Extracts of Plants; preparations formed by boiling vegetables in water, and evaporating the clear

liquor to a thick consistence. As procured in this way it must generally have an intermixture, greater or less, of those principles, which are soluble in water; and from being so liable to decomposition, it must be injured during the evaporation. It is the basis, too, though in a similar state of intermixture and partial decomposition, of what are named the inspissated juices of plants. It exists also in the seeds, leaves, bark and wood.

Though the characters of this principle appear to be distinctive, there is still some ambiguity with regard to it, particularly from the circumstance, that these characters are not uniform; a principle existing in some vegetables which has some of these distinctive properties, without the others; as, for example, in Peruvian bark, the active matter of which is rendered inert and insoluble by decoction in water, and so far has one of the peculiar properties of extract; while it has not the other, that of equal solubility in alcohol and water, but is more soluble in the former than in the latter. Nor is there any certainty that this extractive matter has been obtained pure and insulated; and is therefore possible that it may consist of some of the other principles in a state of mixture, their properties being modified by their reciprocal action.

Tannin. The important medicinal property of astringency, appeared from some chemical facts to be dependent in vegetable substances on a peculiar principle, as it is discoverable in them by a chemical test, that of striking a deep purple colour with the salts of iron. This effect is exhibited by all the powerful vegetable astringents, and in a degree nearly proportional to their astringency. A peculiar acid having been discovered to exist in these astringents, afterwards named Gallick Acid, it was supposed to be the principle on which this property depends. But subsequent experiments have proved, that it resides in a principle of a different nature, which being the agent chiefly concerned in the operation of tanning, has received the name of Tan or Tannin.

This principle exists in all the powerful vegetable astringents; it is extracted by maceration with water, and is detected in the infusion by a peculiar test, that of the animal principle denominated Gelatin. If a solution of gelatin is added to the infusion, it becomes turbid, and a precipitate is thrown down composed of the tannin and

gelatin in combination. We have no very perfect process for obtaining tannin in an insulated state ; but the most simple is precipitating it from the infusion of a vegetable astringent by lime water, and afterwards submitting the compound of lime and tannin, which is formed, to the action of dilute muriatick acid, which abstracts the lime, and leaves the tannin.

Tannin evaporated from its solution is loose and friable, having a resinous fracture, of a brown colour, a peculiar odour, and a taste rough and bitter. It is soluble in water, either cold or warm, and in alcohol not very highly rectified. It appears to suffer decomposition from exposure to the air in a humid state. By the acids, it is precipitated from its watery solution, and by some of them is decomposed. It unites with the alkalis, forming soluble compounds ; with the earths it forms compounds of sparing solubility ; it exerts affinities to the metallick oxides ; and it is principally from its action that infusions of vegetable astringents produce dark coloured precipitates with metallick salts. Exposed to heat, it affords an acid liquid, an oil, and a considerable quantity of carbonick acid, leaving a spongy charcoal.

Its action on animal gelatin is its most important property in relation to the object of the present outline, as on this probably depends its astringent power ; it combines with it, forming an insoluble precipitate, whence it corrugates and renders more dense the animal fibre of which gelatin constitutes a principal part. It exists in all the powerful vegetable astringents, mixed with extractive matter, mucilage, gallick acid, and other principles. It has also been established, that it is capable of being artificially formed, principally by the action of sulphurick and nitrick acids on vegetable products which abound in carbonaceous matter.

Vegetable Acids. The acid found in the juices and other parts of plants, is not always the same. Not less than seven acids, different from each other, are of vegetable origin,—the gallick, oxalick, malick, citrick, tartarick, benzoick and ascetick. To these may be added the prussick, though this is more peculiarly formed from animal matter.

Gallick Acid. The existence of this acid in some of the more powerful astringents, particularly in the gall nut, can be discovered by their watery infusion reddening the infusion of litmus. If the concentrated infusion be left

exposed to the air for some months, this acid is deposited in the state of a crystalline deposite, mixed with mucous flakes, from which it may be purified. It may also be obtained by sublimation from the gall nut, or even by distillation with water, though it is doubtful whether, as procured by these or other processes, it is altogether free from tannin; that by sublimation appears to be most so. By crystallization it is obtained in slender prisms of a white colour; its taste is sour, and it reddens the vegetable colours; it is soluble in twenty-four parts of cold, and in less than two parts of boiling water; it is also soluble in alcohol. It suffers decomposition from heat; and the process indicates a large quantity of carbon in its composition. It combines with the alkalis and earths, and also with the metallick oxides, forming with the latter, in general, coloured precipitates; it is doubtful, however, whether these colours are not in a great measure derived from the tannin adhering to it.

Gallick Acid was at one time supposed to be the principle of astringency, from being contained in the vegetable astringents, and giving a dark colour with the salts of iron, the chemical test by which astringency appears to be indicated. It is doubtful, however, as has been just remarked, whether this latter property does not arise from the presence of tannin: the colour it does produce is less deep too, than that which the infusion itself strikes; and the acid in its insulated state has no astringency: tannin is much rather to be considered as the astringent principle, and it exists accordingly in some of the more powerful vegetable astringents, as in catechu or kino, with scarcely any trace of gallick acid.

Malick Acid is contained in the juice of unripe apples, and other fruits; it is uncrystallizable, forming when evaporated merely a thick liquor, which, if the heat be continued, becomes charred. By this and by the properties of the salts which it forms, it is principally distinguished from the other vegetable acids.

Citrick Acid often accompanies the malick acid in the juices of unripe fruits; and it exists in a purer form in the juice of the lemon and lime from which it is extracted; the mucilaginous matter of the juice being separated by alcohol. It crystallizes in rhomboidal prisms; which, when it is pure, are colourless; its taste is extremely sour; it is abundantly soluble in water; its solution under-

goes spontaneous decomposition, but the crystallized salt can be preserved without injury. The more powerful acids decompose it, converting it principally into acetick acid.

Oxalick Acid exists in the juice of the sorrel (oxalis acetosella) and some other plants, combined with a portion of potash not sufficient to neutralize it. It can also be artificially formed by subjecting fecula, gum, or sugar, to the action of nitrick acid. It crystallizes in slender prisms of a white colour; its taste is extremely sour; it is soluble in twice its weight of cold water, and an equal weight of boiling water; it is also soluble in alcohol. It is decomposed by the more powerful acids: in its decomposition by heat, it affords little empyreumatick oil; hence it appears to contain a small proportion of hydrogen; and as some of the other vegetable acids are converted into it by the action of nitrick acid, there is probably a large proportion of oxygen in its composition. The test by which it is peculiarly distinguished, is the insoluble precipitate it forms with lime, which it attracts from all the other acids.

Tartarick Acid. This acid, as it exists in vegetables, is usually combined with potash, in such a proportion, however, as to leave an excess of acid in the combination. This forms the super-tartrite of potass which is contained in a number of vegetable fruits. It is deposited from the juice of the grape in its conversion into wine, or in the slow fermentation which the wine suffers when kept. The acid procured from this salt is in tabular crystals, transparent; they are very soluble in water, the solution when concentrated being of an oily consistence. It is decomposed by heat, affording a large quantity of liquid acid little changed, with much carbonick acid gas. By nitrick acid repeatedly distilled from it, it is converted into oxalick acid. This acid is an important one in pharmacy, from the numerous combinations of it applied to medicinal use.

Benzoick Acid is obtained from the vegetable balsams, generally by the process of sublimation. It condenses in slender crystals, white and brilliant. It is volatile, as this mode of preparation shows; its vapour is also inflammable, it is very sparingly soluble in cold water, but abundantly in hot water, the solution on cooling depositing nearly the whole of the acid in prismatick crystals: it is also soluble in alcohol, from which it is precipitated

by cold water; it is pungent, but not very acid to the taste: in its usual state its smell is fragrant, especially when it is heated; but this odour has been supposed to arise from a minute portion of the oil of the balsam adhering to it; as by repeated combinations with an alkaline base and precipitation by an acid, it is obtained at length inodorous. It is not easily decomposed by the action of the more powerful acids. Decomposed by heat, it affords a larger quantity of empyreumatick oil than any other vegetable acid, whence hydrogen is supposed to predominate in its composition.

Acetick Acid. This acid has been considered as more exclusively the product of fermentation; it exists likewise, however, ready formed in the sap of the vine, and, combined with alkalis and earths, very generally indeed in the sap of plants. In its pure and concentrated state, in which state it can be procured only by artificial processes, it is a very powerful acid, highly pungent and fragrant, volatile and inflammable, and is distinguished by the peculiar action it exerts on some of the other proximate principles of plants,—essential oil, resin, gum-resin, camphor, gluten, and caoutchouck, which it dissolves without decomposing. Hence, even in its diluted state, under the form of distilled vinegar, it is sometimes used as a solvent in pharmaceutick processes; though it is seldom that it can be employed to advantage, as it is liable to modify the powers of the substances it dissolves.

Prussick Acid. The substance to which this name is given, is formed from some varieties of animal matter by artificial processes. It had often been remarked, that its odour is similar to that of the peach blossom, and that the same odour is perceptible in the distilled water of the cherry laurel, and of the bitter almond. This led to experiments on these; whence the fact, rather singular, has been discovered, that all of them contain this acid. The fact, not less important, has been established, that the narcotick property possessed by these distilled waters depends on the prussick acid. In its insulated state, this substance is volatile, so that it escapes even from its watery solution under exposure to the air. It has no sensible sourness, and does not redden even the more delicate vegetable colours. The character of acidity is therefore given to it, rather from its powers in the combinations it forms,

especially those with the metallick oxides, than from its properties in its insulated state.

Several of the vegetable acids, particularly the citrick, malick, and tartarick, exist together in the same vegetable, and in proportions varying according to the stage of vegetation, whence it is probable that they are mutually convertible. They seldom exist pure, but generally in combination with saccharine, mucilaginous and extractive matter. Combined with alkaline and earthy bases, they form what have been named the essential salts of plants.

The last of the proper proximate principles of vegetables is lignin, or wood; the substance which, composing the vessel of the plant, is the basis through which the other principles are diffused, or to which they are attached, and which is the basis therefore of all the parts of vegetables, with the exception of their secreted juices. It is, when freed from the principles diffused through it, insipid, inert and insoluble, liable in a humid state to slow spontaneous decomposition, inflammable and decomposed by heat, leaving a large residuum of charcoal, which indicates carbon to be its predominant ingredient, whence probably arises its solidity and comparative chemical inactivity. Being insoluble in water, or in alcohol, it forms the greater part of the residuum, when the active matter of vegetable substances has been abstracted by maceration in these solvents.

Besides the principles which can thus be obtained in a distinct form from vegetables by analysis, there are others of a more subtile nature, which have been supposed to exist in vegetable matter, though scarcely capable of being exhibited in an insulated state; such are the Aroma or Spiritus Rector of Plants, the Acrid Principle, the Bitter Principle, and the Narcotick Principle.

The Aroma is the principle in which the odour of plants has been supposed to reside. This quality is generally found in the essential oil; but there are some vegetables, having a strong odour, which yield little or no essential oil; such as the jessamine, the violet, or the rose; or, if this oil be procured from them in small quantity, it has not that strength of odour which, considering their fragrance, and the smallness of its quantity, might be expected from them. They exhale this odour, however, when exposed to the air; it is at length dissipated, or it is communicated to water by distillation at a very gentle

heat. Hence it has been concluded, that a principle more subtile than the essential oil exists in which the odour resides, and that it is even this principle which communicates odour to the oil.

These facts, however, are altogether inconclusive. The property of odour may belong to any of the proximate principles of vegetables, and does belong to principles of very different kinds; it exists in other bodies in which we cannot suppose the existence of any common principle; nor is there any reason to assume the existence of such a principle in plants: and all the facts which have been considered as favourable to the opinion, are accounted for on the supposition that essential oil is the more common principle of odour, and is capable of being volatilized in small quantity at a low temperature, and of thus being diffused through the atmosphere, or communicated to water.

The existence of an acrid principle has been inferred from an acrimony residing in some plants, which they lose on drying, while their other active powers remain; and from this acrimony being in some cases transferred to water or alcohol by distillation. It is not very certain, however, if this quality is not in such cases connected with some of the known proximate principles; nor has this acrid principle, if it do exist, been obtained so as to submit it to chemical examination.

A principle has been supposed to exist in some of the vegetable bitters in which their bitterness resides. It is obvious, however, that the quality of bitterness may belong to any of the known proximate principles; and the qualities which have been assigned to this principle as it exists in some vegetables, particularly in gentian or quassia, such as equal solubility in water, and in alcohol, and being precipitated by certain re-agents, rather prove it in these cases at least to be a variety of extractive matter.

A narcotick principle has been supposed to exist, from the narcotick power of some vegetables being impaired by age, without any apparent loss of matter, and from its being rendered inert by decoction, though no volatile matter is collected possessed of the quality. But such facts are rather favourable to the conclusion, that the loss of power is owing to chemical changes in one or other of the known principles, probably the extract, in which the narcotick quality may be supposed to reside. In

submitting opium to analysis, it has been affirmed, that a crystalline matter is obtained, which proves narcotick, and has been supposed to be the principle on which that quality possessed by the opium depends. But it does not, admitting its existence, appear to be possessed of the narcotick property in that high degree we should expect, were it the principle on which that property is dependent, nor is there any proof that it exists in any other narcotick.

The existence of all these principles, therefore, is extremely problematical; and the qualities assigned to them may, with much more probability, be referred to modifications of composition in the known principles, which are probably too subtile to be ever determined by chemical analysis.

Alcohol, and the *Ethers* formed from it by the action of acids, cannot be regarded as vegetable products; yet they have a relation to these, as their chemical constitution is similar, and they cannot be formed but by changes produced in vegetable matter. As important medicinal and pharmaceutick agents, they are entitled to notice.

Alcohol is formed by the process of fermentation from saccharine matter, or from fecula, the latter being previously subjected, partially at least, to the operation of malting, by which it is in fact converted into the former. The fermented liquor being distilled affords the alcohol formed during the process, diluted with water, and with some impregnation of odour from the fermented substance. From this pure alcohol is procured by repeated distillation, the abstraction of the water from it being aided by the action of potash, or rather sub-carbonate of potash.

Alcohol is a colourless transparent fluid, having a specifick gravity, according to its state of concentration, from 0.835 to 0.800; it is fragrant and pungent, and in its action on the living system possesses a high degree of stimulant and narcotick power; it is volatile, and inflammable, affording, during its combustion, no products but water and carbonick acid, the quantity of water exceeding even the weight of the alcohol. It contains, therefore, much hydrogen in its composition, with which carbon is combined, and perhaps also a portion of oxygen. It combines with water in every proportion, and in consequence of the affinity between these fluids, they mutually

precipitate substances which either has dissolved, that are insoluble in the other. It is decomposed by the acids, affording, as the principal product, the different ethers. As a pharmaceutick agent, it is of much importance from the solvent power it exerts on a number of the vegetable proximate principles,—essential oil, camphor, extract, and others, and by its property too of counteracting the spontaneous changes to which vegetable matter is liable.

Ether. The name Ether is given to a peculiar product obtained by the action of the more powerful acids on alcohol, the product differing in its properties according to the acid employed in its formation, but in general being extremely light, volatile, and inflammable. Sulphurick ether, formed by the action of sulphurick acid on alcohol, has a specifick gravity not greater, when it is pure, than 0.716; it is so volatile as to evaporate rapidly at the common temperature of the atmosphere; in burning it affords water and carbonick acid: its odour is fragrant and penetating; its taste pungent; it is soluble in water only in limited proportion, about one part in ten. It exerts on the vegetable principles the same solvent action nearly as alcohol, except on extract, which it has been said to precipitate,—an effect, however, I have not been able to obtain from it. Nitrick ether is equally light and even more volatile; it is inflammable; it is soluble in water in limited quantity, but combines with alcohol in every proportion: its odour is strong and penetrating. Muriatick ether is more volatile than either, existing in the state of gas, under the atmospherick pressure, at 60°; at 50 it becomes liquid, and its specifick gravity is not less than 0.874; it is transparent, colourless, odorous, and pungent. Acetick ether is moderately light, volatile, and inflammable, soluble in water in limited quantity, and has no odour ethereal, but approaching also to that of vinegar. All these ethers appear to differ from alcohol, principally in having a larger proportion of hydrogen in their composition, to which probably their greater levity and volatility are to be ascribed; and they generally contain a portion of the acid by the action of which they have been formed, which, in some of them at least, appears essential to their chemical constitution.

Having pointed out the distinguishing properties, and the general pharmaceutick relations of the proximate prin-

ciples of vegetables, it may be proposed as a question important in relation to the object of the present outline, Do these principles usually exist in the vegetable in a state of chemical combination, whence some modification of their powers might result, or are they more generally mechanically mixed?

The latter appears to be generally the case. These principles can often be observed existing apart from each other, and even placed in separate vesicles. They can in many cases be separated by mechanical means; and even where they are more intimately mixed, that change of properties does not take place, which we must have expected were they chemically united, the virtues of each principle being discernible in the entire mixture, weakened, but not changed. It seems to follow, therefore, that the virtues of vegetable substances do not depend on chemical combinations of their proximate principles, but rather on the peculiar ultimate composition of one or other of these principles. Hence also it is evident, that in separating the proximate principle of any vegetable, we cannot expect to alter or improve its virtues, farther than in concentrating them by a separation from what is inert, or in separating principles which are possessed of different or even opposite powers. The attainment of these ends, however, is, in innumerable cases, of importance in their exhibition as medicines.

From this enumeration of the Proximate Principles of Vegetables, we may perceive the reasons for those pharmaceutick processes to which plants are usually subjected.

Vegetable matter being liable to decomposition when in a humid state, from the re-action of its elements and their entering into new combinations, exsiccation is an operation to which they are generally subjected, to preserve them without injury. It is performed either by the action of a current of air, or by exposure to heat, care being taken that the heat shall not be such as to dissipate any of their volatile principles, or cause any chemical change.

By infusion in water, the fluid is impregnated with the gum, sugar, extract, tannin, saline substances, part of the essential oil, and part also of the resinous principle. The aroma of the plant is generally first taken up: by longer infusion the water is loaded with the colouring, astringent, and gummy parts: these are also most abundantly dissolv-

ed when the temperature is high. Hence an infusion differs according as the water has stood longer or shorter on the materials, and according as it has been promoted or not by heat. An infusion made in the cold is in general more grateful, while one made with heat, or by keeping the fluid long upon the materials, is more strongly impregnated with active matter.

By decoction or boiling, the solvent power of the water is still farther increased; and hence the liquor always appears darker coloured, and is, in fact, more loaded with the principles of the vegetable which it can hold dissolved. The volatile parts, however, particularly the essential oil, are entirely dissipated; and therefore it is an improper process for those vegetables whose virtues depend, wholly or partially, on these parts. Even the fixed principles of vegetables, at least some of them, are injured, by long decoction. The extractive matter, for instance, gradually absorbs oxygen from the atmosphere, and is converted into a substance nearly insipid and inert. Opium, Peruvian bark, and many other vegetables, are injured in this manner by decoction, especially if the atmospherick air is freely admitted; and these two circumstances, the dissipation of the volatile matter, and the oxygenation of the extractive, considerably limit the application of this process. It is still used, however, with advantage, to extract the mucilaginous parts of vegetables, their bitterness, and several others of their peculiar qualities.

Alcohol may be applied to vegetables to extract those principles which are not soluble in water. It dissolves entirely their essential oil, camphor, and resin; and as these are often the parts on which the virtues of vegetables depend, these solutions, or tinctures as they are termed, are often active preparations.

Equal parts of alcohol and water, in general, extract still more completely the active matter of plants, as we thus obtain a solution of all those substances which are separately soluble in either of these fluids.

When by the action of one or both of these fluids we obtain a solution of the active principles of a vegetable, the solution may be evaporated to the consistence of a thick tenacious mass. This forms what is termed an extract: it is named an aqueous extract when obtained from the aqueous infusion or decoction of a plant, and spiritous when alcohol has been the solvent. The design

of this preparation is to obtain the active matter of the vegetable in a small bulk, and in such a state that it may be preserved a long time without suffering any alteration. It is evident, that it is a process which can be properly applied to such plants only as have their virtues dependent on some of their fixed principles; and even these are often injured by the heat applied, and the free access of the atmospherick air.

Distillation is another process applied to vegetable substances, by which we obtain some of their active principles, particularly their essential oil. If the vegetable matter be heated with a large portion of water, the oil is volatilized with the aqueous vapour: it separates from the water on being allowed to remain at rest; a part of it, however, is also dissolved, and communicates to the water a considerable degree of flavour, and often also of pungency. This forms what are named distilled waters. If alcohol be used instead of water, the essential oil is completely dissolved in it, and we thus obtain what are termed distilled spirits.

By such processes we extract the active matter of vegetables from the inert matter with which it is more or less mixed, and are enabled to administer many remedies under a variety of forms, suited to particular circumstances. A single example will show the utility of investigations of this kind, respecting the component principles of vegetable products, and their relations to the more important chemical agents. Peruvian bark is one of the most important remedies in the materia medica. Practitioners have not always found it practicable to exhibit it in substance with advantage, as where the stomach is uncommonly irritable, or where from the nature of the disease, it is necessary to give it in large doses, frequently repeated, it is apt to occasion sickness and other uneasy sensations, and even to be rejected by vomiting. Such inconveniences are attempted to be obviated, by giving it in the different forms of infusion, decoction, tincture, or extract, as any of these may be best suited to the case. Our knowledge of its constituent parts can only lead us to the proper application of these processes. From an accurate analysis of this bark, it has been proved that seven parts out of eight consist of woody fibre, or of a matter inert and insoluble, which cannot act on the system, and which affects the stomach only by its weight and

insolubility. The remaining eighth part is that in which the activity of the medicine resides; it is therefore evident that if this be extracted, without injuring its activity, the medicine could be exhibited with much more advantage. This is in part accomplished by the preparations of it that have been mentioned; but even these do not convey it in all its force. If one ounce of the bark be infused or boiled in a certain quantity of water, the infusion or decoction is not nearly equal in efficacy to the whole quantity of bark operated on. It is therefore evident, that during either of these operations, the active matter of the bark has not been entirely extracted, or has suffered some change. And here chemistry lends her assistance, and still farther elucidates the peculiar nature of this substance, and the changes produced in it by these processes. It has been proved by experiment, that the matter on which the power of the bark depends, has a strong attraction for oxygen at a temperature moderately increased; that during the infusion and particularly during the decoction of that drug, this active matter absorbs oxygen from the atmosphere, and is converted into a substance insipid and inert. This leads to the improvement of the preparations of this medicine; and experiments instituted for the purpose have accordingly proved, that, while by long boiling the virtues of the bark are nearly totally destroyed, they are fully extracted by a few minutes decoction in covered vessels. The same investigations have pointed out the nature of the action of some other substances on bark, formerly not well understood. Thus, it has been found by experience, that the alkalis, and more particularly magnesia, enable water to extract the virtues of bark, more completely by infusion,—a circumstance elucidated by the fact since discovered, that the extractive matter of the bark, to which its activity is owing, combines with facility with these substances, and forms soluble compounds.

Similar examples might be given from several other important vegetable remedies, which would sufficiently prove the utility to be derived from the analysis of the substances belonging to the vegetable kingdom, and that indeed researches of this kind are absolutely necessary for their proper preparation as medicines.

The account of the analysis of animal substances, and of their proximate principles, would, to the same extent at least, be foreign to the objects of this sketch, as so few of these substances are employed in medicine ; and of those which are used, the composition, and consequently the pharmaceutick treatment, are in a great measure peculiar to each.

Their general chemical characters are similar to those of vegetable principles.—Composed of a few ultimate elements, the differences in their properties arise in a great measure from the different proportions, or the different modes in which these are combined. And these elements having powerful reciprocal attractions, and being disposed to enter into combinations almost indefinitely diversified with regard to these circumstances, these substances are extremely susceptible of decomposition, from the reaction of their elements, favoured by humidity, by the action of the air, or by elevation of temperature. They are even more liable to this than vegetable substances ; for their elements existing in simultaneous combination are more numerous, their affinities are therefore more nicely adjusted, and of course the equilibrium is more easily subverted.

Along with carbon, hydrogen, and oxygen, which are the chief constituent principles of vegetable matter, nitrogen, and frequently sulphur and phosphorus enter into the composition of animal substances. Hence, when decomposed by heat, they afford products composed of these, of which ammonia is always the principal ; and the reaction of these principles, and the evolution of the products arising from this, seem principally to form the series of changes which constitute putrefaction, the species of spontaneous decomposition to which animal matter is more peculiarly subject.

Like vegetable substances, the animal products consist of various proximate principles, and some analogy may be traced between several of the vegetable and animal proximate principles. Animal fat has a strict connexion in properties and composition with fixed oil; animal mucus resembles vegetable mucilage ; fecula has a similar relation to gelatin ; vegetable and animal gluten are nearly if not entirely the same ; a substance similar to saccharine matter exists in milk, and in some of the other animal

secretions: in the bile is found a principle strictly analogous to resin; and benzoick, oxalick and acetick acids are common to both. Hence, generally speaking, the few animal substances belonging to the materia medica are acted on by the usual solvents in nearly the same manner as vegetable substances, and are submitted to similar pharmaceutick processes. The results of these are similar officinal preparations. Thus, by the action of alcohol, the active matter of musk, castor, and cantharides is extracted, and tinctures of these are employed. In other cases water is the proper solvent, particularly of those which consist of gelatin; but such solutions being very liable to decomposition, must always be of extemporaneous preparation.

SECTION II.

Of the Pharmaceutical Operations to which the Articles of the Materia Medica are subjected.

Natural substances, it has been remarked, are not always obtained in that state in which they are best adapted to exhibition as remedies. They are subjected, therefore, to various processes, with the view of preserving them, or of preparing them for use; and to complete this statement of the principles of pharmaceutick chemistry, the nature of these is to be pointed out.

These processes, or at least the greater number, and the most important of them, are chemical, and are dependent therefore on the agencies of those general forces whence chemical changes arise; they are indeed little more than applications of these, under peculiar regulations adapted to different substances. The general facts, therefore, connected with the operation of these forces are first to be stated, in so far as they have any relation to the present subject.

The force principally productive of chemical action, is that species of attraction exerted between the particles of bodies, which brings them into intimate union. If two substances of different kinds be placed in contact, and with that degree of fluidity which admits of the particles of the one moving to those of the other, it often happens that they unite together, and form a substance in which

neither can be any longer recognised, and which is homogeneous, and in general possessed of new properties. This constitutes what, in the language of chemistry, is named combination, and is conceived to arise from an attraction exerted between the particles of the one body to those of the other. It is this which is denominated chemical attraction or affinity, and which is distinguished from the other species of attraction by the phenomena to which it gives rise, or by the laws it obeys,—from the attraction of gravitation, by not being exerted at sensible distances, or on masses of matter, but only at insensible distances, and on the minute particles of bodies,—from the attraction of aggregation, by being exerted between particles of different kinds, and forming a substance with new properties, while that force operates on particles of a similar nature, and of course unites them into an aggregate in which the same essential properties exist. It is possible that these forces, though thus distinguished, may be the result of the same power modified by the circumstances under which it acts.

The substance formed by chemical combination is named a compound. The substances united are the constituent or component parts or principles of the compound. When these are separated, the process is named decomposition. The most minute parts into which a body can be resolved without decomposition are named its integrant parts; and it is between these that the force of aggregation is conceived to be exerted. Chemical attraction is exerted between the constituent parts.

The most important phenomena attending chemical combination is a change of properties. In general, the form, density, colour, taste, and other sensible qualities, as well as the fusibility, volatility, tendency to combination, and other chemical properties in the compound, are more or less different from what they are in either of its constituent parts, and frequently indeed they are wholly dissimilar. There are cases, too, however, where the change is less considerable, as is exemplified in several of the operations of Pharmacy,—the solution of the vegetable proximate principles in water or in alcohol, or the solution of salts in water, in which the body acquires merely the liquid form, with perhaps a slight change of density, but in which no important property is changed, nor any new one acquired.

Chemical attraction is not an invariable force exerted by every body to every other, and always with the same degree of strength. Between many substances it does not sensibly operate, though this perhaps may be owing to the predominance of external circumstances, by which its operation is influenced, rather than to the absence of all mutual attraction. It is exerted too by each body towards others, with different degrees of strength.

It is not limited in its action to two bodies, but is frequently exerted at the same time between three, four, or a greater number, so as to unite them in one combination. Such compounds are named Ternary, &c. according to the number of their constituent principles; they are abundant among the productions of nature, and can be formed also by the arrangements of art.

This force is exerted too, so as to combine bodies in more than one proportion; and, from the union of two substances in different proportions, compounds are formed frequently as dissimilar in their properties as if they were composed of principles totally different. In some cases, the combination is unlimited with regard to proportions, in others, it is fixed to two or three relative quantities, and there are examples where it can be established in only one proportion. The opinion has been maintained, and is probably just, that the tendency of chemical attraction is to unite bodies indefinitely with regard to proportion, and that determinate proportions are established only by the operation of external forces.

The compounds formed by the exertion of chemical attraction have apparently the same relation to this power as simple bodies have: they have a similar tendency to combination, unite in different proportions, and with different degrees of force; and all these combinations are accompanied by the same phenomena, and appear to observe the same laws. It has been supposed, however, that when compound substances combine together, the combination is the result, not of the mutual attraction between the integrant particles of these compounds, but of the affinities of their ultimate elements modified by the condition in which they exist.

In all cases attraction is much modified, and its results determined by circumstances foreign to the attractive force itself. The operation of these circumstances has been established with more precision by the labours of

Berthollet, and been proved to be more important than was formerly believed. They require, therefore, more distinct enumeration, especially as some of them give rise to important results in the processes of pharmacy.

1st. Quantity of matter influences affinity, an increase in the relative quantity of one body with regard to another enabling it to act with more force; or, as the law has been stated, "every substance having a tendency to enter into combination, acts in the ratio of its affinity and its quantity." Hence an effect can be produced from the mutual action of two bodies, when one is in a certain relative proportion to the other, which will not be obtained when the proportion is changed,—a circumstance of much importance in pharmacy, requiring, in particular, attention towards insuring the uniform strength of active preparations; and of much influence too on the results of chemical decomposition, rendering it frequently partial, where it was supposed to be complete.

2nd. *Cohesion*, or the state of a body with regard to the aggregation of its integrant particles, must obviously modify the chemical action of another body upon it, by opposing a resistance which must be overcome before the union of their particles can be effected; hence the cause, that two solid bodies seldom act chemically on each other, and that fluidity promotes chemical action. But besides this obvious effect, cohesion, even when it has been overcome, still modifies the exertion of chemical attraction, by resuming its force whenever the force of that attraction is diminished, and thus sometimes giving rise to new combinations; and sometimes too, when suddenly established in consequence of the affinities becoming effective, it determines the proportions in which bodies combine, by insulating the compound at a certain stage of the combination. It is thus the most powerful cause in placing limits to the exertion of chemical attraction. Insolubility is merely the result of the force of cohesion, in relation to the liquid which is the medium of chemical action, and its action is of course similar; and great density, or specifick gravity, so far as it influences attraction, operates in nearly the same manner, counteracting it, by withdrawing the substances between which it is to be exerted from the sphere of mutual action.

3d. *Elasticity*, or that property of bodies arising from repulsion between their particles, and present to any extent

only in those existing in the aeriform state, opposes the exertion of chemical attraction, by enlarging the distances at which these particles are placed. Hence aerial fluids combine in general with difficulty; and hence too, a compound which contains an ingredient which, when insulated, assumes the aerial state, is more easy of decomposition, and the decomposition is more complete, than a compound, the ingredients of which are fixed; for the tendency to elasticity in the volatile ingredient counteracts the mutual affinity; and when by the application of heat, or the operation of a superiour attraction, any portion of it is displaced, by assuming the elastick form it is withdrawn from the sphere of action, and ceases to oppose any obstacle by its affinity or quantity to the progress of the decomposition. Elasticity too, by counteracting attraction, places limits to the proportions in which bodies combine.

4th. The last circumstance influencing attraction is temperature, or the state of a body with regard to heat or cold, which sometimes favours, and in other cases subverts combination. The cause of temperature is a peculiar subtile power or principle, (in modern chemical language denominated calorick,) capable of being communicated to bodies, and of being in part at least withdrawn from them. Its immediate tendency is to establish a repulsion between their particles; hence it gives rise to expansion or enlargement of volume, greater in each body according to the quantity of calorick introduced. This progressive augmentation of distance, at which the particles are placed by its action, is accompanied with a proportional diminution in the force of cohesion; if carried, therefore, to a certain extent, that force is so far modified, that the particles become capable of moving easily with regard to each other,—a state which constitutes fluidity; and, if the communication of calorick be continued, the expansion still continuing, the particles are at length placed at such distances, that the attraction is entirely overcome, and they repel each other,—a state which constitutes the aerial, or gaseous form. The operation of calorick in influencing chemical attraction, appears to depend on the changes it occasions in the cohesion and elasticity of bodies,—favouring combination by diminishing cohesion, counteracting or subverting it by communicating or increasing elasticity; these effects too being often produced together, and modifying each other.

From the difference of the forces of affinity among bodies, or still more perhaps from the operation of those circumstances by which affinity is modified, its power is often suspended or overcome, and substances which have been combined are separated. This forms what in chemistry is named decomposition, and it presents results equally important with those from combination.

The decomposition may be simple, that is, a compound may be resolved into its constituent parts, each of which is insulated. This is in general effected by the agency of heat. Within a certain range of temperature, the affinity which has combined two bodies continues to operate; but when the temperature is raised, and when the bodies differ in their volatility, or the tendency they have to assume the elastick form, the elasticity of the more volatile one is so far favoured by the elevated temperature, that the mutual affinity is overcome, and it is disengaged. It is generally obtained pure; but the fixed substance, from the influence of quantity on chemical attraction, frequently retains a portion of the other combined with it.

Decomposition is more complicated when it is produced by the introduction of a third substance, which exerts an attraction to one of the ingredients of a compound. When this is effective, the body added combines with this ingredient, forming a new compound, and it is only the other ingredient of the original compound that is obtained insulated. A case still more complicated is, where two compound substances are brought to act on each other, and the principles of the one exert affinity to those of the other; so that an interchange takes place, the two compounds are decomposed, and two new ones are formed. Both these kinds of decomposition are likewise materially modified by the state with regard to temperature. The former case used to be named by chemists single elective attraction; the latter double elective attraction; and both were considered as the results of the relative forces of attraction among the bodies concerned. But there is reason to believe that they arise from the operation of cohesion, elasticity, and the other forces that influence attraction; and that but for the operation of these forces, three or more bodies presented to each other would enter into simultaneous union, instead of passing into binary combinations.

Galvanism, as well as calorick, influences chemical affini-

ty, and by the attractive as well as by the repulsive force it exerts, is even more powerful in producing decomposition. It scarcely admits, however, of being applied to any pharmaceutick process.

The operations of pharmacy are generally dependent on these chemical powers; they consist of arrangements of circumstances with the view either of promoting their exertion or of obtaining the products of chemical action.

Some preliminary operations are frequently had recourse to of a mechanical nature, to diminish the cohesion of bodies, or enlarge their surface. Such are pulverization, trituration, levigation, granulation, &c.

Pulverization is the term employed where solid bodies are reduced to powder by beating. Trituration that where the same effect is produced by continued rubbing. Levigation denotes the operation where the powder is rubbed to a still greater fineness, the rubbing being facilitated by the interposition of a fluid, in which the solid is not soluble. As by any of these operations, the powder must consist of particles of unequal size, the finer are separated from the coarser by sifting or washing. Sifting is passing the powder over a sieve, the interstices of which are so minute as to allow only the finer particles to pass. Washing or Elutriation, is an operation performed only on substances which are not soluble in water. The powder is diffused through a quantity of that fluid, and the mixture is allowed to remain at rest. The coarser particles quickly subside, and the finer remain suspended. It is then decanted off, the powder is allowed to subside, and is afterwards dried. These methods of reducing bodies to powder, can be applied to very few of the metals, their force of cohesion being too strong. They are mechanically divided by rasping, or by being beat into leaves; or they are granulated,—an operation performed by melting the metal, and when it is cooled down as far as it can be, without becoming solid, pouring it into water: it passes to the solid state, assuming the granular form.

In pharmacy, these operations are sometimes of importance, besides merely promoting chemical combination, as there are some medicines which act with more certainty, and even with more efficacy, when finely levigated, than when given in a coarse powder.

As means of promoting chemical combination, it is

evident, that they can act only indirectly; the bodies being far from being reduced to their minute particles, between which only chemical attraction is exerted. They are therefore employed, merely as preliminary to those operations in which such a division is obtained by chemical means.

Of these, the first is solution. By this is understood that operation in which a solid body combines with a fluid in such a manner that the compound retains the fluid form, and is transparent. Transparency is the test of perfect solution. When the specifick gravity of a solid body differs not greatly from that of a fluid, it may be diffused through it, but the mixture is more or less opaque; and on being kept for some time at rest, the heavier body subsides; while in solution the particles of the solid are permanently suspended by the state of combination in which they exist, and are so minute as not to impair the transparency of the liquid.

The liquid has, in this case, been regarded as the body exerting the active power, and has been named the solvent or menstruum; the solid is considered as the body dissolved. The attraction, however, whence the solution proceeds, is reciprocal, and the form generally proceeds from the larger quantity of the liquid employed, and from the absence of cohesion being more favourable to the combination proceeding to a greater extent.

In general, the solution of a solid in a liquid can be effected only in a certain quantity. This limitation of solution is named saturation; and when the point is reached, the liquid is said to be saturated with the solid. As the fluid approaches to saturation, the solution proceeds more slowly. When a fluid is saturated with one body, this does not prevent its dissolving a portion of another; and in this way three, four, or five bodies may be retained in solution at the same time by one fluid. In these cases, the fluid does not dissolve so large a proportion of any of these substances, as if it had been perfectly pure, though sometimes the whole proportion of solid matter dissolved is increased from the mutual affinities the bodies exert. Neither is the solvent power always thus limited, there being many cases where a solid may be dissolved in a fluid to any extent. Gum or sugar, for example, will dissolve in water, and form a perfect solution in every proportion.

An increase of temperature, in general, favours solution, the solution proceeding more rapidly at a high than at a low temperature; and in those cases, in which a certain quantity only of the solid can be combined with the fluid, a larger quantity is taken up when the temperature is increased. The quantity dissolved is not in every case promoted alike by an increase of temperature; water, for example, having its solvent power, with regard to nitre, greatly increased by augmentation of temperature, while sea salt is dissolved in nearly as great a quantity by water at a low as at a high temperature. This difference in these salts, and in many others, depends on the difference in the degree of their fusibility by heat; those which are most easily fused having their solubility in water most largely increased by increase of temperature. All these facts, indeed, with regard to solution, are explained, by considering this operation as depending on chemical affinity overcoming cohesion in the body dissolved.

Agitation favours solution, by bringing successively the different parts of the liquid into contact with the solid, and thus preventing the diminished effect which arises from the approach to saturation in the portion immediately covering the solid. The mechanical division of a solid too, is favourable to its solution, principally by enlarging the surface which is acted on.

Solution is an operation frequently had recourse to in pharmaceutical chemistry, the active principles of many bodies being dissolved by their proper solvents. Salts are dissolved in water, as are also gum, extract, and other vegetable products. Products of a different kind, as resin, camphor, and essential oils, are dissolved in alcohol and wine; and metals are rendered soluble and active by the different acids. Solutions in water, alcohol, or wine, possess the sensible qualities and medical virtues of the substance dissolved. Acid and alkaline liquors change the properties of the bodies which they dissolve. In pharmacy, the operation receives different appellations, according to the nature of the solvent, of the substance dissolved, and of the manner in which it is performed. When a fluid is poured on any vegetable matter, so as to dissolve only some of its principles, the operation is named *Extraction*, and the part dissolved is said to be extracted. If it is performed without heat, it

is termed *Maceration;* if with a moderate heat, *Digestion;* if the fluid is poured boiling hot on the substance, and they are kept in a covered vessel till cold, this is denominated *Infusion*. *Decoction* is the term given to the operation when the substances are boiled together. It is evident, that these are all instances of solution, varied only by particular circumstances; and I have already stated, under the analysis of the vegetable part of the materia medica, the advantages belonging to each. Lixiviation is the term applied to solution performed on saline substances where the soluble matter is separated, by the action of the solvent, from other substances that are insoluble; and the solution obtained in this case is named a ley.

The other principal method by which that fluidity necessary to chemical action is communicated, is fusion. It requires, merely with regard to each substance, the necessary degree of heat; and where this is high, it is performed usually in crucibles of earthen ware, or sometimes of black lead, or on a large scale in iron pots.

Chemical combination is frequently promoted by an elevation of temperature, though the heat may not be so high as to produce fusion, but only to diminish cohesion to a certain extent. Calcination, as it used to be named, or metallick oxidation, is an example of this; a metal being heated to a high temperature, so as to enable it to combine with the oxygen of the air. Deflagration is a similar operation, an inflammable or metallick substance being exposed to a red heat in mixture with nitre: the acid of the nitre yields its oxygen; which being thus afforded in large quantity and nearly pure, the oxidation takes place with rapidity, and generally to its *maximum*.

When chemical action has been exerted, other operations are sometimes required to obtain the product, or sometimes this product is formed and collected in the operation itself.

By evaporation, or dissipating a liquid by the application of heat, a solid substance which has been dissolved in it is recovered, and this operation is one frequently performed in pharmacy. When performed on a small scale, vessels of glass, or of earthen ware, are generally employed, and the heat is applied either by the medium of sand, or if it is required to be more moderate, the vessel is placed over water which is kept boiling, forming what is named the water bath, or *Balneum Mariæ*. When

performed on a larger scale, shallow iron pots or leaden troughs are used, to which the fire is directly applied; and experiments have shown that the operation is conducted more economically when the liquor is kept boiling strongly than when it is evaporated more slowly by a more gentle heat. There is, on the other hand, however, some loss, from part of the dissolved substance being carried off when the heat is high, by its affinity to the liquid evaporating; and in many cases in pharmacy, particularly in the evaporation of vegetable infusions or tinctures, the flavour, and even the more active qualities of the dissolved substance, are liable to be injured, especially towards the end of the operation, by a strong heat.

When the object is to obtain the volatile matter by evaporation, the process is of course conducted in close vessels adapted to condense the vapour and collect the liquid. This forms the operation of distillation, which, with regard to different substances, requires to be conducted in various modes.

When a volatile principle is to be obtained from vegetable substances by this process, the difficulty is to apply the heat sufficiently without raising it too high. The mode generally employed is to heat the vegetable matter with water, and the distillation is then usually performed in the common still. At the heat of boiling water, the essential oil of plants, which is the chief volatile principle they contain, is volatilized; it rises with the watery vapour; is condensed; if little water has been employed, the greater part of the oil is obtained apart; if much has been used, it retains it dissolved, acquiring taste and flavour, and thus forming the distilled water of plants. If alcohol, pure or diluted, has been the medium of distillation, it always retains the oil in solution, and forms what are named distilled spirits. The still in which the operation is performed with these views is of copper, or iron; it consists of a body and head, the former designed to contain the materials, and to which the fire is applied, the latter to receive the vapour; there issues from it a tube, which is connected with a spiral tube, placed in a vessel, named the refrigeratory, filled with cold water. The vapour, in its progress through the tube, is condensed, and the liquid drops from the extremity of it.

When metallick matter would be acted on, by the materials or the product of distillation, vessels of glass or

earthen ware are employed ; the retort, which is generally used, being connected with a single receiver, or with a range of receivers, according as the vapour is more or less easily condensed ; or, if the product is a permanently elastick fluid, which cannot be condensed but by passing it through water, a series of bottles connected by tubes, on the principle of Woolf's apparatus, is used. When the product obtained by distillation is not perfectly pure, it can be frequently purified by a second distillation ; the process is then named *Rectification:* when it is freed from any superfluous water combined with it, the operation is named *Dephlegmation* or *Concentration.*

When the product of volatilization is condensed, not in the liquid, but in the solid form, the process is named Sublimation, and the product a Sublimate. As the condensation takes place with much more facility, a more simple apparatus is employed, consisting usually of a conical bottle or flask with a round bottom, thin and equal, named a cucurbit, in which the materials are contained, heat being applied by the medium of a sand bath. The vapour condenses in the upper part of the flask forming a cake, which adheres to it, the orifice being lightly closed to prevent any part from being lost ; or a globular head, with a groove at its under edge, and a tube to convey off any liquid that may be condensed, (a capital as it is named,) being applied.

When a solid substance is thrown down from a liquid by chemical action, it forms the operation of precipitation, and the matter thrown down is named a precipitate. Frequently the substance precipitated is one which had been dissolved in the liquid, and which is separated by a substance added, combining with the liquid, and weakening its attraction to the one which it held in solution. Or sometimes it arises from a compound being formed by the union of one body with another, which is insoluble in the liquid that is the medium of action. The precipitate is allowed to subside, is usually washed with water, and is dried. From the law of chemical attraction, that quantity influences the force of affinity, it often happens that the precipitate either retains in combination a portion of the substance by which it had been dissolved, or attracts a portion of the substance by which it is thrown down, and this sometimes proves a source of impurity, or of peculiar powers in medicinal preparations.

When a substance, in passing to the solid state, assumes a regular geometrick form, the process is named crystallization, and these figured masses are denominated crystals. Their forms are various, though nearly constant with regard to each substance; they are usually transparent, hard, and have a regular internal structure. The crystallization may happen in two ways, from a state of solution. If a saturated solution has been prepared with the aid of heat, the increased quantity of the solid which the heat has enabled the liquid to dissolve, separates as the temperature falls; and the attraction of cohesion being thus slowly exerted between the particles. unites them so as to form crystals. Or, if a portion of the solvent be withdrawn by evaporation, and especially by slow evaporation, the particles of the solid unite slowly, and with a similar result.

In both these kinds of crystallization from a watery solution, the crystallized substance always retains a quantity of water, and frequently even a considerable proportion in its composition. It is essential to the constitution of the crystal, its transparency, structure and form, and is hence named the water of crystallization. Some crystals lose it from mere exposure to the air, when they are said to effloresce; others attract water, and become humid, or deliquesce.

Crystallization is promoted by the mechanical action of the air; likewise by affording a nucleus, whence it may commence, and especially a crystal of the substance dissolved; and with regard to a few substances, their affinity to the solvent requires to be diminished by the addition of another substance to enable them to crystallize.

In pharmacy, crystallization is of importance, by enabling us to obtain substances, especially those belonging to the class of salts, in a pure form; different salts, even when present in the same solution, being thus separated by their different tendencies to crystallization, according as they are more or less soluble in the solvent, or have their solubility more or less promoted by heat; and each salt, when it does crystallize, being in general pure.

These are the principal operations of pharmacy. Connected with this subject, there remain to be noticed the weights and measures which are usually employed. The division, according to what is named troy weight, is that

ordered in the pharmacopœias. Its parts, with the symbols by which they are denoted, and their relative proportions, are represented in the following table:

A pound (libra,)	℔	contains	12 ounces.
An ounce (uncia,)	℥		8 drachms.
A drachm (drachma,)	ʒ		3 scruples.
A scruple (scrupulus,)	℈		20 grains (grana,) gr.

Measures have been subdivided in a similar manner, being made to correspond to the specifick gravity of water. As the specifick gravities of liquids vary, however, considerably, a source of errour is introduced in applying the standard measure to different liquids, unless the due allowance be made for the difference in specifick gravity. This it is to be presumed will often be neglected, and hence the Edinburgh college have rejected the use of measures, and given the proportions of every liquid by weight. The use of measures, however, in apportioning liquids, being more easy and convenient, will probably always be retained; and the London college have therefore, in the late edition of their pharmacopœia, sanctioned their use. They adopt measures subdivided from the wine gallon, as represented with their symbols in the following table:

A gallon (congius,)		contains	8 pints.
A pint (octarius,)	O		16 fluidounces.
A fluidounce (fluiduncia,)	f℥		8 fluidrachms.
A fluidrachm (fluidrachma,)	fʒ		60 minims (minima,) ♏.

This last measure is one newly introduced. In apportioning liquids into very small quantities, the quantity has been usually estimated by drops (gutta, gtt.) allowed to fall from the edge of the mouth of a bottle; but the size of the drop is liable to vary much, not only according to the mobility and specifick gravity of the liquid, a circumstance of little importance, since with regard to each substance it remains the same, but also according to the thickness of the edge and degree of inclination. The London College have therefore substituted this division of *minims*, which are measured in a slender graduated glass tube. The measure of a table and of a tea spoonful are sometimes used in extemporaneous prescription.

and though not very accurate, may be admitted where a small difference in the dose is not important. The one is understood to be equal to half an ounce by measure, the other to about one drachm.

The following characters are also in general use.

℞ Recipe, *Take.*
ā āā. ana, *of each.*
ss. *the half of any thing.*
Cong. Congius, *a gallon.*
Cochl. Cochleare, *a spoonful.*

PART II.

MATERIA MEDICA.

The Materia Medica comprehends all those substances whether natural or artificial, which are employed as remedies; and in the Pharmacopœias lately published by the colleges of London, Dublin, and Edinburgh, the simple articles composing the catalogue are arranged in alphabetical order; and the same plan is also adopted by the Massachusetts Medical Society in their Pharmacopœia, and in the American Pharmacopœia. In the very respectable and learned production of which the preceding pages are a part, Mr. Murray has exhibited a new classification: it seems, however, more eligible to adhere to the system most generally adopted, and to employ that nomenclature, which will also coincide with the plan of the Pharmacopœia which is the basis of this work. A considerable number of unimportant European articles are excluded, and several new indigenous substances introduced; to these is subjoined a short view of the natural, medical, and pharmaceutical history, with the virtues and doses of each. As, however, Murray's medicinal distribution of substances, and explanation of their operations, are the most unexceptionable of any that have hitherto appeared, it may be proper to premise his observations relative to a new classification of the articles of the materia medica; and his concise view of their operations on the living system.

In explaining the operations of medicines, and classing them according to these operations, it is to be regarded as a first principle, that they act only on the living body. The presence of life is accompanied with peculiar properties, and with modes of action, inexplicable on mere mechanical or chemical principles. Substances acting on the living system no doubt produce effects referrible to these; but the changes they produce are also always so far modified as to be peculiar in themselves, and regulated by laws exclusively belonging to organized matter.

Medicines, in general, operate by stimulating the living fibre, or exciting it to motion. This proposition has even been stated as universal, and was received as an axiom, in a system superiour, perhaps, to any, in conveying just and precise ideas on the nature of life, and the affections to which it is subject. Medicines, in common with all external agents, are, according to this system, incapable of directly altering the state of the vital power: they can only excite the parts possessed of that power to action; and however diversified their effects may appear to be, such diversities are to be referred merely to the different degrees of force in which they exert the general stimulant power they possess.

This proposition cannot, however, be received in an unlimited sense. From the exhibition of different medicines, very different effects are produced, which cannot be satisfactorily explained from the cause assigned,—the difference in the *degree* of stimulant operation. They differ in *kind* so far, that even in the greater number of cases, one remedy cannot by any management of dose or administration be made to produce the effects which result from the action of another.

It is therefore necessary to admit some modifications of the general principles above stated; and the following are perhaps sufficient to afford grounds for explaining the operations of remedies, and for establishing a classification of them sufficiently just and comprehensive.

I. Stimulants are not to be regarded as differing merely in the degree of stimulant operation which they exert. An important distinction exists between them, as they are more or less diffusible and permanent in their action. A stimulus is termed diffusible, which, whenever it is applied, or at least in a very short time after, extends its action over the whole system, and quickly produces its full exciting effect. A diffusible stimulus is generally also transient in its action; in other words, the effect, though soon produced, quickly ceases. There are others, on the contrary, which, though equally powerful stimulants, are slow and permanent. These varieties, which are sufficiently established, serve to explain the differences in the powers of a number of the most important medicines; and they lay the foundation for the distinction of two great classes, narcoticks and tonicks, with their subordinate divisions of antispasmodicks and astrin-

gents, both consisting of powerful stimulants; the one diffusible and transient, the other slow and permanent in their operation.

II. There is a difference between stimulants, in their actions being directed to particular parts. Some, when received into the stomach, quickly act upon the general system; others have their action confined to the stomach itself, or, at least, any farther stimulant effect they may occasion is slow and inconsiderable; while a third class consists of those which operate on one part, often without producing any sensible effect on the stomach or general system. Some thus act on the intestinal canal; others on the kidneys, bladder, vessels of the skin, and other parts; the affection they excite in these, being the consequence, not of any stimulant operation equally extended over every part, but of one more particularly determined. This difference in the action of stimuli is the principal foundation of the distinctions of medicines into particular classes. Catharticks, for instance, are those medicines, which, as stimuli, act peculiarly on the intestinal canal: diureticks, those which act on the secreting vessels of the kidneys: emmenagogues, those which act on the uterine system: diaphoreticks, those which exert a stimulant action on the vessels of the skin. With these operations, medicines, at the same time, act more or less as general stimulants, by which each individual belonging to any class is thus rendered capable of producing peculiar effects; and many of them, by a peculiarity of constitution in the patient, or from the mode in which they are administered, frequently act on more than one part of the system, by which their effects are still farther diversified. Medicines, when thus determined to particular parts, are sometimes conveyed to these parts in the course of the circulation; more generally their action is extended from the stomach, or part to which they are applied, by the medium of the nervous system.

III. Medicines, besides acting as stimuli, sometimes occasion mechanical or chemical changes in the state of the fluids or solids, by which their action is more or less diversified. These operations of medicines were formerly supposed to be more extensive than they really are; and many absurd explanations were deduced from the supposed changes which the solids and fluids underwent in disease. Though these notions are now exploded, it must still be

admitted that changes of this kind take place in the living system. Chemical changes in particular, there is reason to believe, very frequently modify the actions of remedies; and some very obvious operations of this kind, as well as others of a mechanical nature, serve as distinctions for establishing several particular classes.

These observations point out the principles on which the arrangement of the articles of the materia medica, from their medicinal operations, may be established.

Those stimulants, which exert a general action on the system, may first be considered. Of these there are two well marked subdivisions, the diffusible and the permanent; the former corresponding to the usual classes of narcoticks and antispasmodicks; the latter, including likewise two classes, tonicks and astringents. In these there is a gradual transition passing into the one from the other, from the most diffusible and least durable stimulus, to the one most slow and permanent in its action.

The next general division is that comprising local stimulants; such are the classes of emeticks, catharticks, emmenagogues, diureticks, diaphoreticks, expectorants, sialagogues, errhines, and epispasticks. These all occasion evacuation of one kind or another, and their effects are in general to be ascribed, not to any operation exerted on the whole system, but to changes of action induced in particular parts.

After these, those few medicines may be considered whose action is merely mechanical or chemical. To the former belong diluents, demulcents, and emollients. Anthelminticks may perhaps be referred with propriety to the same division. To the latter, or those which act chemically, belong antacids or absorbents, lithontripticks, escharoticks, and perhaps refrigerants.

Under these classes may be comprehended all those substances capable of producing salutary changes in the human system. Several classes are indeed excluded which have sometimes been admitted; but these have been rejected, either as not being sufficiently precise or comprehensive, or as being established only on erroneous theory.

The subdivisions of these classes may sometimes be established on the natural affinities existing among the substances arranged under each; on their chemical composition; their resemblance in sensible qualities; or, lastly,

on distinctions in their medicinal virtues, more minute than those which form the characters of the class. In different classes one of these methods will frequently be found preferable to any of the others.

TABLE OF CLASSIFICATION.

A. General stimulants.

a. Diffusible. { Narcoticks. Antispasmodicks.

b. Permanent. { Tonicks. Astringents.

B. Local stimulants. Emeticks. Cathartick. Emmenagogues. Diureticks. Diaphoreticks. Expectorants. Sialagogues. Errhines. Epispasticks.

C. Chemical remedies. Refrigerants. Antacids. Lithontripticks. Escharoticks.

D. Mechanical remedies. Anthelminticks. Demulcents. Diluents. Emollients.

CLASS I.—NARCOTICKS.

This first division of the preceding classification, is that comprehending those stimulants, the action of which is general over the system. The first class of this division comprises those which are highly diffusible, and at the same time transient in their operation. This corresponds with the common class of narcoticks or sedatives, usually defined, Such substances as diminish the actions and powers of the system, without occasioning any sensible evacuation. The definition is imperfect, as it does not include that stimulant operation which it is acknowledged they equally produce.

When given in a moderate dose, narcoticks excite the functions both of body and mind: the force and frequency of the pulse are increased, muscular action is more vigorous, and hilarity or intoxication are induced. These symptoms, after continuing for some time, are succeeded by those of diminished action: the pulse becomes slower, is full and soft, the body is less sensible to impressions, and less capable of voluntary exertion, and the mind is inactive. This state terminates in sleep. When it ceases, there remains a degree of general debility, marked by sickness, tremour and oppression. By a large dose, debility, without previous excitement, is occasioned, and the consequences of an immoderate quantity are delirium, paralysis, coma, and convulsions, sometimes terminating in death. These are the general effects, considerably diversified, however, as arising from different narcoticks, and varied by other circumstances. Habitual use considerably diminishes their power.

These medicines act primarily on the stomach, whence their action is conveyed by nervous communication to the general system. Externally applied, they exert their usual action, though with less force. Directly applied to the muscles of animals, they first stimulate them to contraction, but ultimately exhaust their irritability.

As the medicines belonging to this class diminish the actions of the system, when given even in small doses, their primary operation was generally considered as of a depressing kind; and the stimulant effects which occasionally appeared to be produced by their exhibition, were ascribed to what was termed the re-action of the system, or the exertion of that salutary power supposed to belong to the living body, by which every noxious application is resisted and thrown off. They were therefore considered as *directly* sedative, and *indirectly* stimulant.

Precisely the reverse of this doctrine was likewise advanced. As their exciting effects were those which appeared first, and were succeeded by those of debility, and as the first were produced from a small dose, while the others were occasioned when the dose was comparatively large, these substance were regarded as direct stimulants, capable of exciting the actions of the system; and the symptoms of debility which they so frequently produced, were considered as arising from that exhaustion of power, which, according to a general law of the system,

always follows increased action suddenly raised and not kept up. They were regarded, therefore, as *directly* stimulant, and *indirectly* sedative, and the peculiarities of their action were ascribed to their rapid and transient stimulant operation.

If, in investigating this subject, we merely contrast these two theories, little doubt can remain of the superiority of the latter. The suppositions of there being a power in the living system, fitted to resist any noxious agent, and of such a power acting before the deleterious effects have taken place, and thus retarding or preventing their production, are improbable and unsupported by any satisfactory proof. Since the stimulant operation of narcoticks always precedes the symptoms of languor and debility which they produce; it is the direct conclusion, that these latter are the consequences of the former. The analogy between narcoticks and other substances, admitted to be stimulants, but which are less rapid in their operation, is also in many respects so direct, as to prove similarity of action. And their utility in several diseases, in which they are employed as stimulants, is scarcely consistent with the opinion, that they possess a real depressing power. Some doubt, however, is still attached to the theory that they are direct stimulants, from the fact, undoubtedly true, that the sedative effects of narcoticks are frequently disproportioned to their previous stimulant operation, allowing even in such cases, for its rapidity and little permanence; and the proposition, though apparently somewhat paradoxical, is perhaps just, that these substances are at once capable of stimulating the living fibre, and, independent of that stimulant operation, exhaust to a greater or less extent, by *direct* operation, the living power. The effects of certain chemical agents on the living system, as lately ascertained, appear to support some conclusion of this kind.

Narcoticks being capable of producing either stimulant or sedative effects, may be practically employed with very different intentions. Either operation is obtained chiefly by certain modes of administration. If given in small doses, frequently repeated, the actions of the system are excited, and kept up. But if given in larger doses, at distant intervals, the state of diminished action and lessened sensibility is obtained. As stimulants, they are employed in various diseases of debility; in intermittent

fever, and continued fevers of the typhoid type; in gout, hysteria, &c. As sedatives, they are used to allay pain and irritation, to procure sleep, and diminish secretions; hence their applications in spasmodick and painful diseases, in hæmorrhagies and increased discharges. In an inflammatory state of the system, the use of some of them is not altogether without danger from their stimulating effects.

CLASS II.—ANTISPASMODICKS.

This class might perhaps be considered as a subordinate division of narcoticks. They have similar virtues, being used principally to allay pain and inordinate action, and they differ only in not producing that state of general insensibility and diminished action, which arises from the action of narcoticks. This might be supposed owing merely to a difference in power; yet there seems also to be something more than this, since they produce no such effect in any dose, and since, although they are so much inferiour to narcoticks in this respect, they are equally powerful in repressing inordinate and irregular muscular action. This difference may be explained, on the supposition that they are equally powerful stimulants, but are less diffusible, and more durable in their action, or that they are powerful diffusible stimulants, possessing little direct power of diminishing the excitable principle. Considered in this point of view, they will form an intermediate class between narcoticks and tonicks; and experience shows, that they partake of the properties of both; several narcoticks and tonicks being frequently used as antispasmodicks.

From the name given to this class, their effects may be easily understood. Spasm is an irregular contraction of a muscle; sometimes the contraction is permanent, at other times it alternates with relaxation, but is still irregular. Such medicines as obviate and remove such affections, are termed antispasmodicks.

Spasm may arise from various causes. One of the most frequent is a strong irritation continually applied; such as dentition or worms. In these cases, narcoticks prove useful, by diminishing irritability and sensibility. Sometimes spasm arises from mere debility; and the obvious means of removing this is by the use of tonicks.

Both narcoticks and tonicks, therefore, are occasionally useful as antispasmodicks, such as opium, camphor, and ether, in the one class, and zinc, mercury, and Peruvian bark, in the other. But there are farther, several substances which cannot be with propriety referred to either of these classes, and to these the title of antispasmodicks may be more exclusively appropiated.

CLASS III.—TONICKS.

By tonicks, are understood those substances whose primary operation is to give strength to the system. Their operation is not mechanical, as was once conceived; they act not on the simple solids, increasing their tension or tone, but on the living fibre, and are merely powerful stimulants, permanent in their operation. By producing a gradual excitement, they give vigour to the actions of the system, and as that excitement is gradually produced, it is in like manner gradually diminished, and the habitual stimuli continuing to operate, diminished action does not succeed. Where tonicks, however, are given in excess, are used unnecessarily, or for too long a time, they weaken the powers of life.

Tonicks act primarily on the stomach, the action they excite in that organ being communicated generally by the medium of the nerves to the rest of the system. Some of them, however, are received into the mass of blood.

The immediate effects of a tonick, given in a full dose, are to increase the force of the circulation, to augment the animal heat, promote the various secretions, or moderate them when morbidly increased, quicken digestion, and render muscular action more easy and vigorous. By some of them, however, these effects are very slowly induced.

The affections of the system in which tonicks are employed, must be obviously those of debility; hence their use in the greater part of the diseases to which mankind are subject.

This class may be subdivided into those individuals derived from the mineral, and those from the vegetable kingdoms.

The former division comprehends several of the metals and one or two of the earths. These are in general

more local in their nature than the vegetable tonicks, they do not operate so speedily, and seldom occasion considerable excitement.

TONICKS FROM THE VEGETABLE KINGDOM.

The tonick power in vegetables in intimately connected with certain sensible qualities, with their bitterness, astringency, and aromatick quality, all of them perhaps possessing these qualities, though, in each, one may be more predominant than the other. The purest bitters, astringents, and aromaticks, possess also more or less of a tonick power. Of these divisions, the pure astringents form a distinct class; the remaining tonicks may be arranged according as the bitterness or aromatick quality is predominant in them.

The stimulant operation of the purer bitters is little diffusible, and very slow in its operation; their effects are principally on the stomach and digestive organs, to which they communicate vigour, though they also act in some degree on the general system, and obviate debility, as is evident in particular from their efficacy in intermittent fevers, in dropsy, and gout, and from their debilitating effects when used for too long a time.

Aromaticks are more rapid and diffusible in their action; they quicken the circulation, and augment the heat of the body. Their action has little permanence; hence, in medicine, they are employed either as mere temporary stimulants, or to promote the action of bitters or astringents.

From these different modes of action of bitters and aromaticks, it is evident, that a more powerful tonick will be obtained from the combination of these qualities than where they exist separately. The most powerful tonicks are accordingly natural combinations of this kind.

AROMATICKS.

The substances belonging to this subdivision of the vegetable tonicks, stimulate the stomach and general system, augment the force of the circulation, and increase the heat of the body. They are scarcely sufficiently permanent in their action to be used by themselves as tonicks; but they always promote the action of bitters and astrin-

gents, and are used with advantage to obviate symptoms arising from debility of the stomach or intestinal canal. Their aromatick quality in general resides in an essential oil, which in each of them varies in flavour, pungency, and other sensible qualities, but which is nearly alike in its chemical properties. It is soluble entirely in alcohol, is sparingly soluble in water, and is extracted from them by distillation.

CLASS IV.—ASTRINGENTS.

Astringents have been usually considered as substances capable of obviating or removing increased evacuations, by their power of constringing or condensing the simple solids, of which the vessels are formed, and this by an action entirely chemical or mechanical, the same as that which they exert on dead animal matter.

Allowing, however, these substances to possess some power of this kind, their effects as remedies cannot be explained merely from its exertion. Increased evacuations cannot be ascribed to mere mechanical laxity of the solids; and their removal cannot be referred to simple condensation of these solids. Neither can it be admitted that active substances may be applied to the system without occasioning changes in the state of the living powers. Many substances, arranged as astringents, occasion very considerable alterations in several of the functions; they produce effects too which cannot be solely referred to a condensing power, and therefore, in all the changes they produce, part at least of their operation must be referred to their acting on the powers peculiar to life.

For reasons of this kind, some have denied the existence of such remedies, and have considered those which usually receive the appellation of astringents, merely as stimulants, moderate and permanent in their action; in other words, as *tonicks* of inferiour power. But though there be a great analogy between these two classes in their effects, and probably in their mode of operation, there is also a very obvious difference: the most powerful astringents,—that is, substances which immediately restrain excessive evacuations, being much inferiour in real tonick power to other substances having little astringency; while there are powerful tonicks, or medicines capable of removing debility, which do not with any uniformity produce the immediate effects of astringents.

Perhaps astringents may be regarded as moderate permanent stimulants, having their stimulant operation modified by their power of condensing the animal fibre by a mechanical, or rather a chemical action. That they exert a stimulant operation, is proved by their power of curing intermittent fever, and other diseases of debility; and that they possess a constringing quality is evident, not only from the sensation they excite on the tongue, but is proved by the change they produce in animal matter. If these combined actions be exerted on the fibres of the stomach, the change produced, it is possible, may be propagated by nervous communication to other parts of the system.

The hypothesis of Dr. Darwin, that astringents produce their effects by powerfully promoting absorption, though it serves to explain part of their operation, seems to be refuted by their power of stopping hæmorrhage.

Some narcoticks, as opium, have, in certain cases, effects apparently astringent. These are, where increased discharges arise from irritation, in which, by diminishing irritability, they lessen the discharge; but such an operation is altogether different from that of real astringents.

As remedies against disease, astringents may sometimes, from their moderate stimulant operation, be substituted for tonicks. They have thus proved successful in the treatment of intermittent fever; and in all cases of debility, they seem to be serviceable, independent of their power of checking debilitating evacuations.

It is, however, for restraining morbid evacuations that astringents are usually employed. In the various kinds of hæmorrhagy, menorrhagia, hæmoptysis, &c. they are frequently employed with advantage, though their power is also often inadequate to stop the discharge. In diarrhœa they diminish the effusion of fluids, and at the same time give tone to the intestinal canal, and thus remove the disease. In the latter stage of dysentery they prove useful by a similar operation. In profuse sweating, and in diabetes, they are frequently sufficiently powerful to lessen the increased discharge; and in those kinds of inflammation, termed passive, and even in certain cases of active inflammation, they are applied with advantage as topical remedies.

It is an obvious caution, that astringents are not to be used to check critical evacuations, unless these proceed to excess.

Astringents may be subdivided into those belonging to the vegetable, and those belonging to the mineral kingdom, which differ very considerably from each other in their operation.

VEGETABLE ASTRINGENTS.

Astringency in vegetables seems to be connected with a certain chemical principle, or at least with some peculiarity of composition, since vegetable astringents uniformly possess certain chemical properties. The astringency is extracted both by water and alcohol, and these infusions strike a black colour with any of the salts of iron, and are capable of corrugating more or less powerfully dead animal matter.

Chemical investigations have accordingly discovered two distinct principles in the vegetable astringents, one or both of which may probably give rise to the astringent property. One of these, the gallick acid, is distinguished by its property of striking a deep black colour with the salts of iron; the other, the tanning principle, or tannin, is characterized by its strong attraction to animal gelatin, with which it combines, and forms a soft ductile mass, insoluble in water. These may be separated by a solution of animal jelly, which unites with the tannin, and leaves the gallick acid pure.

As both these principles exist in all the stronger vegetable astringents, it is probable that the corrugating property by which the action of these substances as medicines is modified, depends on their combination, especially as, in their action on dead matter, the change produced on the animal fibre by the gallick acid, promotes the combination of that fibre with the tanning principle.

MINERAL ASTRINGENTS.

Of these, the principal are the mineral acids, especially the sulphurick, and the combinations it forms with some of the metals and earths.

LOCAL STIMULANTS.

CLASS V.—EMETICKS.

Emeticks are substances capable of exciting vomiting, independent of any effect arising from the mere quantity

of matter introduced into the stomach, or of any nauseous taste or flavour.

The effects of an emetick, are an uneasy sensation in the stomach, with nausea and vomiting. While the nausea only is present, the pulse is feeble, quick and irregular, and the countenance pale: during vomiting the face is flushed, the pulse is quicker, and it remains so during the intervals of vomiting. When the operation of vomiting has ceased, the nausea goes off gradually; the patient remains languid, and often inclined to sleep; the pulse is weak, but becomes gradually slow and full, and the skin is commonly moist.

The general nature of vomiting is sufficiently evident. The peristaltick motion of the stomach is inverted, the diaphragm and abdominal muscles are called into action by association, and the pylorus being contracted, the contents of the stomach are forcibly discharged. The peristaltick motion of the upper part of the intestinal canal is likewise frequently inverted.

How this peristaltick motion is thus inverted, it is difficult to explain. The substances which have this effect, no doubt possess a stimulant power, but the effect is by no means produced in proportion to the degree of stimulant operation exerted on the stomach, and it has not been explained how such an operation can invert the usual motion.

Dr. Darwin considers vomiting as the effect, not of increased action from the operation of a stimulus, but of diminished action, arising from the disagreeable sensation of nausea. This being induced, the usual motion is gradually lessened, stopt, and is at length inverted, which gives rise to the phenomena of vomiting.

The susceptibility of vomiting is very different in different individuals, and is often considerably varied by disease.

Though nausea generally accompanies vomiting, this is scarcely a necessary connexion: some emeticks acting without occasioning much nausea, while others induce it in a much greater degree than is proportioned to their emetick power.

The feeble and low pulse which accompanies vomiting, has been ascribed to direct association between the motions of the stomach and those of the heart, or it may be owing to the nausea excited, which being a disagreeable sensation, is equivalent to an abstraction of stimulus.

It is supposed also, that a sympathy exists between the stomach and the surface of the body, so that the state of the vessels of the one part is communicated to the vessels of the other. Hence vomiting is frequently followed by diaphoresis.

Emeticks powerfully promote absorption.

They often occasion increased evacuation by the intestinal canal, more especially when they have been given in too small a dose to excite vomiting, an effect arising from their stimulating power.

Lastly, several of the effects of vomiting have been ascribed to the agitation of the body, and to the compression of the viscera, by the action of the diaphragm and abdominal muscles.

Emeticks are employed in many diseases.

When any morbid affection depends upon, or is connected with over-distention of the stomach, or the presence of acrid indigestible matters, vomiting gives speedy relief. Hence its utility in impaired appetite; acidity in the stomach; in intoxication, and where poisons have been swallowed.

From the pressure of the abdominal viscera in vomiting, emeticks have been considered as serviceable in jaundice arising from biliary calculi obstructing the hepatick ducts.

The expectorant power of emeticks, and their utility in catarrh and phthisis, have been ascribed to a similar pressure extended to the thoracick viscera.

In the different varieties of febrile affections, much advantage is derived from exciting vomiting, especially in the very commencement of the disease. In high inflammatory fever, it is considered as dangerous; and in the advanced stage of typhus it is prejudicial.

Emeticks given in such doses as only to excite nausea, have been found useful in restraining hæmorrhage.

Different species of dropsy have been cured by vomiting, from its having excited absorption. To the same effect, perhaps, is owing the dispersion of swelled testicle, bubo, and other swellings, which has occasionally resulted from this operation.

The operation of vomiting is dangerous or hurtful in the following cases: where there is determination of blood to the head, especially in plethorick habits; in visceral inflammations; in the advanced stage of pregnancy; in

hernia, and prolapsus uteri, and wherever there exists extreme general debility.

The frequent use of emeticks weakens the tone of the stomach.

An emetick should always be administered in the fluid form. Its operation may be promoted by drinking any tepid diluent or bitter infusion.

The individual emeticks may be arranged under those derived from the vegetable, and those from the mineral kingdom.

CLASS VI.—CATHARTICKS.

Cathartics are medicines which quicken or increase the evacuation from the intestines, or which, when given in a sufficient dose, excite purging. They evidently act by augmenting the natural peristaltick motion, from their stimulant operation on the moving fibres of the intestines, whence the contents of the canal are more quickly propelled. The greater number, or perhaps all of them, seem likewise to stimulate the extremities of the exhalant vessels terminating on the internal surface of the intestines, and hence the evacuations they occasion are not only more frequent, but thinner, and more copious.

Besides these immediate actions, the stimulant operation of catharticks appears to be more or less extended to neighbouring organs, and hence they promote the secretion and discharge of the bile, and other fluids usually poured into the intestinal canal. It is also exerted on the stomach, so as to occasion a more quick evacuation of the contents of that organ by the pylorus.

Besides the differences between individual catharticks in quickness, slowness, or other circumstances attending their operation, there is a general difference in the mode in which they act, from which they may be, and usually have been ranked under two divisions. Some operate mildly, without exciting any general affection of the system, without even perceptibly stimulating the vessels of the intestines. and hence they merely evacuate the contents of the canal. Others are much more powerful stimulants: they always occasion an influx of fluids from the exhalant vessels, and neighbouring secreting organs: they extend their stimulus to the system in general, and if taken in too large a dose, excite inflammation on the

surface of the intestines. The former are distinguished by the title of laxatives; the latter are termed purgatives, and the stronger of them drastick purgatives.

Catharticks, as medicines, are capable of fulfilling various indications.

Where there exists a morbid retention of the contents of the stomach, where these contents are acrid, or where extraneous bodies are present, they are calculated by their evacuating power to relieve the symptoms arising from these affections, and hence their utility in constipation, colick, dysentery, and a variety of febrile affections. Partly by exciting the intestines to action, and partly by extending their stimulus to the other abdominal viscera, catharticks are of service in dyspepsia, hypochondriasis, amenorrhœa, jaundice, and visceral obstructions.

By their power of stimulating the exhalant vessels, on the internal surface of the intestinal canal, and causing a larger portion of fluid to be poured out, catharticks are capable of producing a diminution of the fluids with respect to the general system, and of course cause an abstraction of stimulus. Hence purging is a principal part of what is termed the antiphlogistick regimen, and is employed as a remedy of much power in highly inflammatory diseases.

From the same power of causing effusion of fluid, is to be explained the utility of catharticks in the various species of dropsy. A balance is preserved in the system between exhalation and absorption, so that when one is increased, the other is so also. The increased secretion and discharge of serous fluid, which catharticks occasion, causes an increased absorption; whence the effused fluid in dropsy is frequently taken up and removed.

Partly by the serous evacuation which catharticks occasion, and partly by the derivation of blood they make from the head, they are highly useful in the prevention and cure of apoplexy, all comatose affections, mania, phrenitis, and headache.

By a change in the distribution of the blood, it has been supposed that purging determines from the surface of the body; and hence in a great measure has been explained its utility in small pox and some other eruptive diseases.

The administration of catharticks is rendered improper by inflammation of the stomach or intestines, or tendency to it, and by much debility. Several cautions are likewise requisite in their exhibition. The nausea or griping

they frequently produce, may be obviated by the addition of an aromatick, or by giving them in divided doses. The more powerful catharticks should always be given in the latter mode; and in general they irritate less when given diffused in a fluid than when given in a solid form.

The different catharticks may be considered under the two divisions of laxatives and purgatives: the former being mild in their operation, and merely evacuating the contents of the intestines; the latter being more powerful, and even extending their stimulant operation to the neighbouring parts.

A division of catharticks remains, intermediate in their operation between the laxatives and purgatives, more powerful than the one, less violent and stimulating than the other. These are the neutral salts. They seem to act principally by stimulating the exhalant vessels on the inner surface of the intestines; and by the watery evacuation they occasion, they are particularly adapted to those cases where inflammatory action or tendency to it exists.

The valuable observations of Dr. Hamilton have established still more clearly the importance of this class of remedies, have shown that they admit of more extensive application, and have pointed out with more precision than has hitherto been done, the principles which regulate their administration.

In many diseases, there exists a state of the intestinal canal giving rise to retention of its contents, which is not to be obviated by the occasional administration of a cathartick, but which requires a continuation of the operation short of that of purging, until the healthy state of the bowels be restored. By this practice the cure of diseases has been accomplished, which, previously to Dr. Hamilton's publication, were treated by very different methods, and were not supposed to be so peculiarly connected with any state of the alvine evacuation. Thus in fever, the peristaltick motion of the intestines is diminished, the feculent matter is retained, and becomes a source of irritation; its evacuation, therefore, by the exhibition of purgatives is clearly indicated, nor has this been altogether neglected.

Physicians, however, were scarcely aware of the necessity of producing it to a sufficient extent; and in fevers of the typhoid type in particular, were frequently deterred from doing so by the fear of reducing the strength of the system by an evacuation considered as debilitating.

Dr. Hamilton's observations establish the propriety of the freer use of purgatives in fever, so as to produce complete and regular evacuation of the bowels, through the whole progress of the disease; and the cases he has published afford striking proofs of the advantages derived from the practice. It is attended with equal advantage in scarlatina. Several of the diseases comprehended under the class neurosis appear to depend on, or to be very intimately connected with a torpid state of the intestines, from which an accumulation of their contents takes place, proving a source of irritation that often affects the general system. Chorea is proved by Dr. Hamilton's observations to arise from this cause, and he has introduced with great success the mode of treatment, by the free use of purgatives, continued until the healthy state of the alvine evacuation has been established. The same practice, and with similar success, applies to hysteria, and, in Dr. Hamilton's opinion, to that species of tetanus, which, prevailing in warm climates, and in warm seasons, appears to have its origin in disorder of the stomach and bowels. And ample evidence has established the success of the same treatment in the marasmus which attacks the young of both sexes, which is marked by loss of appetite, weakness, wasting of the body, and at length total prostration of strength; likewise in chlorosis, and in that hæmatemesis to which females are liable between eighteen and thirty years of age. In some of these diseases, the quantity of matter accumulated in the intestines is extremely great; the extent to which the exhibition of purgatives must be carried, and the length of time during which they must be continued, much exceed what would be calculated on from the usual administration of remedies of this class. The whole practice requires therefore both decision and perseverance. Analogies from some of these diseases lead to a similar exhibition of cathartick in other fevers, particularly in the bilious remitting fever of warm climates, in measles, erysipelas, and small pox; likewise in scrofula, in dyspepsia, whether simple, or complicated with hysterical or hypochondriacal mania; in cramp of the stomach, or of the extremities; in palpitation of the heart, and in those cases of hydrophobia which are not the effect of specifick contagion.

Cathartick, especially the more powerful ones, require to be administered with caution even in diseases where

they are indicated, by peculiar circumstances, particularly any tendency to inflammation or to extreme debility; also during pregnancy, immediately after delivery, during the flow of the menses, and in those liable to hæmorrhoidal affections. The too frequent use of them induces wasting of the body, and sometimes renders the intestines morbidly irritable, so that purging is easily excited, while in other habits it renders them more torpid, and induces costiveness.

Dr. Hamilton has pointed out the common errour in the exhibition of catharticks, that of their not being given to the requisite extent; and given the general rule in all morbid affections, of repeating, and, if necessary, enlarging the dose while the evacuations remain offensive, or of an unnatural appearance, without however carrying their administration so far as to produce purging, unless this be the indication which is designed to be fulfilled. To this class of remedies may be added those substances which act as catharticks under the form of enema.

CLASS VII.—EMMENAGOGUES.

The medicines arranged under this class are those capable of promoting the menstrual discharge.

As the suppresion of this discharge is usually owing to debility of the uterine vessels, or want of action in them, the medicines capable of exciting it must be those which can stimulate these vessels.

General stimulants or tonicks must have this effect to a certain extent, and there are several stimulants both diffusible and permanent, employed as emmenagogues.

It is doubtful, whether there are further any medicines, which have their stimulant operation particularly determined to the uterine vessels. There are several, however, which, acting on neighbouring parts, have their action extended to the uterus, and hence exert an emmenagogue power greater than can be ascribed to any general stimulant operation they exert on the system. Several catharticks act in this manner.

Under one or other of these divisions, may be arranged the principal medicines employed as emmenagogues.

CLASS VIII.—DIURETICKS.

Diureticks are those medicines which increase the urinary discharge.

It is obvious that such an effect will be produced by any substance capable of stimulating the secreting vessels of the kidneys. All the saline diureticks seem to act in this manner. They are received into the circulation, and, passing off with the urine, stimulate the vessels, and increase the quantity secreted.

There are other diureticks, the effect of which appears not to arise from direct application, but from an action excited in the stomach, and propagated by nervous communications to the secreting urinary vessels. The diuretick operation of squill, and of several other vegetables, appears to be of this kind.

There is still, perhaps, another mode in which certain substances produce a diuretick effect, that is, by promoting absorption. When a large quantity of watery fluid is introduced into the circulating mass, it stimulates the secreting vessels of the kidneys, and is carried off by the urine. If, therefore, absorption be promoted, and if a portion of serous fluid, perhaps previously effused, be taken up, the quantity of fluid secreted by the kidneys will be increased. In this way digitalis seems to act: its diuretick effect, it has been said, is greater when exhibited in dropsy than it is in health.

On the same principle, (the effect arising from stimulating the absorbent system,) may probably be explained the utility of mercury in promoting the action of several diureticks.

The action of these remedies is promoted by drinking freely of mild diluents. It is also influenced by the state of the surface of the body. If external heat be applied, diuresis is frequently prevented, and diaphoresis produced. Hence the doses of them should be given in the course of the day, and the patient if possible be kept out of bed.

The direct effects of diureticks are sufficiently evident. They discharge the watery part of the blood; and by that discharge they indirectly promote absorption over the whole system.

Dropsy is the disease in which they are principally employed, and when they can be brought to act, the dis-

ease is removed, with less injury to the patient than it can be by exciting any other evacuation. Their success is very precarious, the most powerful often failing; and as the disease is so frequently connected with organick affection, even the removal of the effused fluid, when it takes place, only palliates without effecting a cure.

Diureticks have been likewise occasionally used in calculous affections, in gonorrhœa, and with the view of diminishing plethora, or checking profuse perspiration.

CLASS IX.—DIAPHORETICKS.

Diaphoreticks are those medicines which increase the natural exhalation by the skin. When this is carried so far as to be condensed on the surface, it forms sweat; and the medicines producing it are named sudorificks. Between diaphoreticks and sudorificks, there is no distinction; the operation is in both cases the same, and differs only in degree, from augmentation of dose, or employment of assistant means.

Since diaphoresis or sweat is merely the increase of the natural exhalation, it must arise from increased action of the cutaneous exhalant vessels, and the medicines belonging to this class must be those which are capable of exciting that action.

Of stimulants capable of producing this effect, the application of heat to the surface affords an example: It is one of the most effectual, and is always employed to promote the action of sudorificks.

The same effect may be produced indirectly, by increasing the general force of the circulation, which acts as a stimulus on the exhalant vessels, and increases their discharge.

By one or other of these modes of operation, the medicines classed as diaphoreticks seem to act.

The saline diaphoreticks, as they do not sensibly augment the force of the circulation, probably act in the former manner, exerting a particular action on the stomach, which is communicated to the vessels of the skin, or perhaps being received into the blood, and directly applied to these vessels.

Those diaphoreticks, on the contrary, which are termed heating, as the aromatick oils and resins, act by directly

stimulating the heart and arteries, and increasing the force of the circulation.

Diaphoresis is not, however, the necessary consequence of the circulation being increased; for the surface often remains dry, where the pulse is frequent and strong. In this case, a morbid constriction of the cutaneous vessels exists, which opposes a resistance to the impetus of the blood. Whatever, therefore, relaxes these vessels, will favour the production of sweating; and to this mode of operation probably is to be ascribed the diaphoresis produced by antimonial preparations, or by ipecacuan, and in part the advantage derived from the use of warm diluents in promoting sweat. When these circumstances, the increase of the force of the circulation, and the relaxation of the cutaneous vessels, are conjoined, the sweating will be still more copious; and from this probably arises the superiority of the combination of opium with antimony or ipecacuan, to any other sudorifick.

The primary effects of diaphoreticks, are to evacuate the watery part of the blood, and thus lessen the quantity of fluid in the circulating system; to determine the blood to the surface; to increase the action of the absorbents, and to remove spasmodick constriction of the cutaneous vessels, and render the skin moist.

The first of these effects probably takes place to no great degree, as the free use of diluents makes part of the sweating regimen.

The last effect, the changing the state of the vessels on the skin, is the most important, considered in a practical point of view, that diaphoreticks produce, as on this their efficacy in fever, in which principally they are employed, depends.

The limits to the practice of sweating in affections of a febrile kind, are now sufficiently established. It is attended with advantage in synocha, and the various phlegmasiæ; but in fevers of the typhoid kind it is useless, and, unless in the very commencement of the disease, is uniformly hurtful.

As evacuating the serous part of the blood, and as promoting absorption, sudorificks have been used with advantage in the different species of dropsy, especially in anasarca.

By determining to the surface, and preserving a gentle diaphoresis, they are found serviceable in asthma, dyspepsia, habitual diarrhœa, chronick dysentery, and chronick

rheumatism, and likewise in a number of cutaneous diseases, probably by altering the state of the extreme vessels of the skin.

A few circumstances are to be attended to in the administration of sudorificks. In inflammatory affections, if the action of the vascular system is strong, bleeding should be previously used: during the sweating, the free use of warm diluents is necessary; and external cold ought to be guarded against.

The particular diaphoreticks may be arranged from the affinity in their operation, as they act by increasing the force of the circulation, or as they operate without producing any general stimulant effect.

CLASS X.—EXPECTORANTS.

Expectorants have been defined, those medicines which facilitate or promote the rejection of mucus or other fluids from the lungs and trachea. The theory of their operation is very imperfectly understood. It has been supposed that where a greater quantity of fluid is thrown out into the lungs than the exhalants can take up, there are remedies which may facilitate its rejection. But as expectoration is an operation partly voluntary, and dependent on the action of a number of muscles, it is difficult to discover how such an effect can be produced. If by expectorants be meant substances capable of producing it by some specifick action on the parts concerned, there seems no reason to believe in the existence of such remedies.

Dr. Cullen supposed that expectorants might act by promoting the exhalations of a thin fluid, which diluting the viscid mucus present in the mucous follicles in the lungs and trachea, might facilitate its rejection. But the action of the different individuals belonging to the class, and especially their effects in various diseases, cannot be explained on this principle.

There are probably various modes of operation by which certain remedies will appear to promote expectoration, and which will give them a claim to the title of expectorants.

Thus, in certain diseases, the exhalant vessels in the lungs seem to be in that state, by which the exhalation of fluid is lessened, or nearly stopped, and in such cases

expectoration must be diminished. Any medicine capable of removing that constricted state, will appear to promote expectoration, and will at least relieve some of the symptoms of the disease. It is apparently by such a mode of operation, that antimony, ipecacuan, squill, and some others, promote expectoration in pneumonia, catarrh, and asthma, the principal diseases in which expectorants are employed.

There is a case of an opposite kind, that in which there is a redundance of mucus in the lungs, as occurs in humoral asthma, and *catarrhus senilis*. In these affections, certain expectorants are supposed to prove useful. If they do so, it is probably by being determined more particularly in their action to the pulmonary vessels, and by their moderate stimulus diminishing the secretion, or increasing the absorption, thus lessening the quantity of fluid, and thereby rendering the expectoration of the remainder more easy. The determination of these substances to the lungs is often perceptible by their odour in the air expired. A similar diminution of fluid in the lungs may be effected by determining to the surface of the body; and those expectorants which belong to the class of diaphoreticks probably act in this manner.

Expectorants, then, are to be regarded, not as medicines which directly assist the rejection of a fluid already secreted, but rather as either increasing the natural exhalation where it is deficient, or diminishing the quantity of fluid where it is too copious, either by stimulating the pulmonary vessels, or by determining to the surface. In both cases expectoration will appear to be promoted or facilitated.

Pneumonia, catarrh and asthma, are the principal diseases in which expectorants are employed; and the mode in which they prove useful will be apparent from what has been said of their operation.

CLASS XI.—SIALAGOGUES.

Sialagogues are substances which increase the quantity of the salivary discharge. This may be effected by the mastication of certain acrid substances, or by the internal exhibition of certain medicines.

Of those which act in the latter mode, *Mercury* is the only one that uniformly produces this effect. No satis-

factory explanation has been given of this peculiar power which it exerts; and the inquiry why it should be particularly directed to the salivary glands, appears as fruitless as that into the specifick virtue of any medicine. It does not from its sialagogue power appear to be of advantage in the treatment of any disease; salivation being only a test of its action on the system, but not in itself of any utility.

The remaining sialagogues are those which act merely by topical application by mastication, and from their acrid stimulating quality. By increasing the salivary discharge, they have been found of service in toothache, and, as has been supposed, in some kinds of headache.

CLASS XII.—ERRHINES.

Errhines are medicines which occasion a discharge from the nostrils, either of a mucous or serous fluid. They all operate by direct application, and generally in consequence of a greater or less degree of acrimony which they possess. Their practical uses, it is evident, must be very limited. By the evacuation they occasion, it is supposed that they may diminish the quantity of fluid in the neighbouring vessels; and that they hence may prove useful in rheumatick affections of these parts, in headache, pain of the ear, and ophthalmia. They are sometimes used with advantage in some of these affections. It has likewise been imagined that they may be of use in preventing apoplexy.

CLASS XIII.—

EPISPASTICKS AND RUBEFACIENTS.

These, as they operate on the same principles, and produce the same effects only in different degrees, may be considered merely as subdivisions of one class.

EPISPASTICKS.

Epispasticks are those substances which are capable, when applied to the surface of the body, of producing a serous or puriform discharge, by exciting a previous state of inflammation. The term, though comprehending

likewise issues and setons, is more commonly restricted to blisters,—those applications which, exciting inflammation on the skin, occasion a thin serous fluid to be poured from the exhalants, raise the cuticle, and form the appearance of a vesicle. This effect arises from their strong stimulating power, and to this stimulant operation, and the pain they excite, are to be ascribed the advantages derived from them in the treatment of disease. The evacuation they occasion is too inconsiderable to have any effect.

It is a principle sufficiently established with regard to the living system, that where a morbid action exists, it may often be removed by inducing an action of a different kind in the same or in a neighbouring part. On this principle is explained the utility of blisters in local inflammation and spasmodick action; and it regulates their application in pneumonia, gastritis, hepatitis, phrenitis, angina, rheumatism, colick, and spasmodick affections of the stomach; diseases in which they are employed with the most marked advantage.

A similar principle exists with respect to pain; exciting one pain often relieves another. Hence blisters often give relief in toothache, and some other painful affections.

Lastly, blisters, by their operation, communicate a stimulus to the whole system, and raise the vigour of the circulation. Hence, in part, their utility in fevers of the typhoid kind, though in such cases they are used with still more advantage to obviate or remove local inflammation.

RUBEFACIENTS.

Rubefacients excite pain and inflammation, but in a less degree than blisters, so that no fluid is discharged. They stimulate the system in general, and obviate local inflammation, and are used for nearly the same purposes as blisters.

Any stimulating application may be used for this purpose.

Cantharides added in a small proportion to a plaster, or the tincture of cantharides applied by friction to a part, is often applied as a rubefacient.

Ammonia mixed with one, two, or three parts of expressed oil, forms a liniment frequently used for this purpose in rheumatism, angina, and other cases of local inflammation.

REMEDIES ACTING CHEMICALLY.

CLASS XIV.—REFRIGERANTS.

The remedies comprised under this class have been usually defined, substances which directly diminish the force of the circulation, and reduce the heat of the body, without occasioning any diminution of sensibility or nervous energy. The theories, that have been delivered respecting their mode of operation, are obscure or unintelligible; and even the facts, which are adduced to establish the existence of such remedies, are far from being conclusive.

Keeping in view the very inconsiderable action of these remedies, it may perhaps be possible, from the consideration of the mode in which animal temperature is generated, to point out how their trivial refrigerant effects may be produced.

It has been sufficiently established, that the consumption of oxygen in the lungs is materially influenced by the nature of the ingesta received into the stomach; that it is increased by animal food and spirituous liquors, and, in general, by whatever substances contain a comparatively small quantity of oxygen in their composition. But the superiour temperature of animals is derived from the consumption of oxygen gas by respiration. An increase of that consumption must necessarily, therefore, occasion a greater evolution of calorick in the system, and of course an increase of temperature, while a diminution in the consumption of oxygen must have an opposite effect. If, therefore, when the temperature of the body is morbidly increased, substances be introduced into the stomach, containing a large proportion of oxygen, especially in a state of loose combination, and capable of being assimilated by the digestive powers, the nutritious matter received into the blood, must contain a larger proportion of oxygen than usual; less of that principle will be consumed in the lungs, by which means less calorick being evolved, the temperature of the body must be reduced; and this operating as a reduction of stimulus, will diminish the number and force of the contractions of the heart.

It might be supposed that any effect of this kind must be trivial, and it actually is so. It is, as Cullen has remarked, not very evident to our senses, nor easily subjected

to experiment, and is found only in consequence of frequent repetitions.

The principal refrigerants are the acids, especially those belonging to the vegetable kingdom. As these contain a large proportion of concrete oxygen in a state of loose combination, their refrigerant power may be explained on the above principle. The neutral salts form the remaining division of refrigerants; they are much inferiour in power; and what refrigerant quality they do exert, probably arises from the same cause. In some of them, it may be increased by the sensation of cold they excite in the stomach, which is equivalent to an abstraction of stimulus.

It is obvious, that the indication to be fulfilled by the use of refrigerants, is the reduction of the morbidly increased temperature. Hence they are administered in synocha and other inflammatory affections, and likewise in fevers of the typhoid kind.

ACIDS.

All acids are supposed to be refrigerants; but the vegetable acids are allowed to possess this power in a more eminent degree.

The native vegetable acids are found chiefly in the fruits of vegetables. The sour juice of these fruits consists either of the citrick or malick acids, or more frequently of a mixture of both. The citrick acid is that which is most largely employed, as it forms chiefly the acid juice of the orange and lemon, the two acid fruits in common medicinal use.

CLASS XV.—ANTACIDS.

Antacids are remedies which obviate acidity in the stomach. Their action is purely chemical, as they merely combine with the acid present, and neutralize it. They are only palliatives, the generation of acidity being to be prevented by restoring the tone of the stomach, and its vessels. Dyspepsia and diarrhœa are the diseases in which they are employed.

CLASS XVI.—LITHONTRIPTICKS.

Lithontripticks are medicines supposed to be capable of dissolving urinary calculi. Their operation is entirely chemical.

The researches of modern chemists have proved, that these calculi, in general, consist principally of a peculiar animal acid, named the lithick or urick acid. With this substance the alkalis are capable of uniting, and of forming a soluble compound; and these are accordingly the sole lithontripticks.

From the exhibition of alkaline remedies, the symptoms arising from a stone in the bladder are very generally alleviated; and they can be given to such an extent, that the urine becomes sensibly alkaline, and is even capable of exerting a solvent power on these concretions. Their administration cannot, however, be continued to this extent for any considerable length of time, from the strong irritation they produce on the stomach and urinary organs. The use, therefore, of the alkalis as solvents, or lithontripticks, is now scarcely ever attempted; they are employed merely to prevent the increase of the concretion, and to palliate the painful symptoms, which they do, apparently by preventing the generation of lithick acid, or the separation of it by the kidneys; the urine is thus rendered less irritating, and the surface of the calculus is allowed to become smooth.

When the alkalis are employed with this view, they are generally given saturated, or even super-saturated, with carbonick acid. This renders them much less irritating. It at the same time diminishes, indeed, their solvent power; for the alkaline carbonats exert no action on the urinary calculi: But they are still equally capable of correcting the acidity in the *primæ viæ*, which is the cause of the deposition of the lithick acid from the urine, and therefore serve equally to palliate the disease. And when their acrimony is thus lessened, their use can be continued for any length of time.

CLASS XVII.—ESCHAROTICKS.

Escharoticks are substances capable of dissolving animal matter; applied to the skin, they erode it, and to

an ulcer, they remove its surface. They are employed to consume excrescences, to open an ulcer, and to change the diseased surface of a sore already existing. Their action is entirely chemical.

REMEDIES ACTING MECHANICALLY.

CLASS XVIII.—ANTHELMINTICKS.

Anthelminticks are those medicines used to expel worms from the intestinal canal. The greater number of them act mechanically, dislodging the worms, by the sharpness or roughness of their particles, or by their cathartick operation. Some seem to have no other qualities than those of powerful bitters, by which they either prove noxious to these animals, or remove that debility of the digestive organs, by which the food is not properly assimilated, or the secreted fluids poured into the intestines are not properly prepared; circumstances from which it has been supposed the generation of worms may arise.

CLASS XIX.—DEMULCENTS.

Demulcents are defined, "Medicines suited to obviate and prevent the action of acrid and stimulant matters, and that, not by correcting or changing their acrimony, but by involving it in a mild and viscid matter, which prevents it from acting upon the sensible parts of our bodies," or by covering the surface exposed to their action.

Where these substances are directly applied to the parts affected, it is easy to perceive how benefit may be derived from their application. But where they are received by the medium of the stomach into the circulating system, it has been supposed that they can be of no utility, as they must lose that viscidity on which their lubricating quality depends. Hence it has been concluded, that they can be of no service in gonorrhœa, and some similar affections. It is certain, however, that many substances which undergo the process of digestion are afterwards separated in their entire state from the blood, by particular secreting organs, especially by the kidneys; and it is

possible that mucilaginous substances, which are the principal demulcents, may be separated in this manner. There can be no doubt, however, but that a great share of the relief demulcents afford in irritation or inflammation of the urinary passages, is owing to the large quantity of water in which they are diffused, by which the urine is rendered less stimulating from dilution. In general, demulcents may be considered merely as substances less stimulating than the fluids usually applied.

Catarrh, diarrhœa, dysentery, calculus, and gonorrhœa, are the diseases in which demulcents are employed. As they are medicines of no great power, they may be taken in as large quantities as the stomach can bear.

The particular demulcents may be reduced to the two subdivisions of mucilages and expressed oils.

CLASS XX.—DILUENTS.

Diluents are defined, those substances which increase the proportion of fluid in the blood. It is evident that this must be done by watery liquors. Water is indeed, properly speaking, the only diluent. Various additions are made to it, to render it pleasant, and frequently to give it a slightly demulcent quality. But these are not sufficiently important to require to be noticed, or to be classed as medicines.

Diluents are merely secondary remedies. They are given in acute inflammatory diseases, to lessen the stimulant quality of the blood. They are used to promote the action of diureticks in dropsy, and to favour the operation of sweating.

CLASS XXI.—EMOLLIENTS.

Emollients are those medicines, according to the definition of Dr. Cullen, which diminish the force of cohesion in the particles of the solid matter of the human body, and thereby render them more lax and flexible. Their operation is mechanical; they are insinuated into the matter of the solid fibre, and lessen the friction between its particles. They are useful when the fibres are rigid, or when they are much extended, and therefore afford relief when topically applied to inflamed parts, to

tumours distending the skin, or where the skin is dry and rigid.

Heat conjoined with moisture is the principal emollient; and water applied warm by the medium of some vegetable substances, constituting the various fomentations and cataplasms, is the form under which it is applied, the vegetable matter serving to retain the heat, and to allow the proper application of the moisture.

Oils and unctuous substances are the only other emollients; they are merely introduced by friction. Any of the expressed oils already noticed, or lard, (axungia porcina) may be used for this purpose.

The preceding observations are inserted, not with the view of adopting Murray's classification of remedies, but to give a general idea of the virtues of such medicinal substances as are possessed of the qualities which make the objects of the respective articles. I shall therefore proceed to an account of each of the remedies separately, and in alphabetical order.

Acidum Acetosum. *Acetous Acid. Vinegar.*

Vinegar was known many ages before the discovery of any other acid, those only excepted which exist ready formed in vegetables. It is mentioned by Moses, and indeed seems to have been in common use among the Israelites and other eastern nations at a very early period. This agreeable pungent acid is the product of the fermentation of solutions of saccharine matter or sweet vegetable juices. It is obtained from wine, cider, beer, or other fermented liquors, which are the products of the first stage of the fermentative process. The acetous fermentation is nothing more than the acidification or oxygenation of wine, produced in the open air by means of the absorption of oxygen. Vinegar is composed of hydrogen and carbon united together in proportions not yet ascertained, and changed into the acid state by oxygen. That prepared from white wine is most free from impurities. Beside the pure acetous acid diluted with much water, vinegar contains tartarous acid, tartrite of potass, mucilaginous matter, and sometimes phosphorick acid. From the mucilaginous impurities which all vinegars contain, they are apt, on exposure to the air, to become turbid and ropy, and at length vapid. This inconvenience may

be obviated by the following method. Boil vinegar in a well tinned kettle for a quarter of an hour, and bottle it, or fill the bottles with vinegar and put them into a kettle full of water upon the fire. After the water has boiled for an hour, they are to be taken out and corked. Vinegar thus boiled, will keep for several years, without growing turbid or mouldy. The acetous acid may be concentrated by suffering vinegar to freeze; after which separate the fluid from the ice, and secure it in a bottle. By the process of distillation vinegar is rectified, and the acetous acid concentrated and rendered more suitable for pharmaceutical preparations.

Vinegar possesses strong antiseptick powers, and its action on the living body is gently stimulant and astringent. It is employed as a useful addition to the patient's drink in putrid and inflammatory fevers. In ardent, bilious fevers, pestilential and other malignant distempers, it is recommended by Boarhaave as one of the most certain sudorificks. In the form of clyster it is used in the same diseases, and in obstinate constipation. Faintings, vomiting,hysterical and hypochondriacal complaints,have been frequently relieved by vinegar applied to the mouth and nose, or received into the stomach. It is highly serviceable in obviating the effects of poisonous substances of the vegetable kind, when taken into the stomach, as well as in promoting their discharge by the different emunctories, when received into the blood. When fully saturated with muriate of soda (common salt) it has been resorted to as a valuable remedy in dysentery, and angina maligna; one table-spoonful of this mixture, with two of hot water, gradually swallowed and frequently repeated, will seldom fail to induce a diaphoresis, and procure essential relief from the most distressing symptoms attending these dangerous diseases.

The same saturated mixture may also be applied to local inflammations with the happiest effects. Vinegar is applied externally in fomentations and baths, as a stimulant and discutient; and its vapour is inhaled in putrid sore throat; and diffused through the chambers of the sick to correct the putrescency of the atmosphere.

Vinegar is an article of very considerable use in surgery. Mixed with farinaceous substances it is frequently applied to sprained joints; and in conjunction with alcohol and water it makes an eligible lotion for inflammation of the surface of the body. Vinegar has acquired

reputation at the Gloucester infirmary, for quickening the exfoliation of dead bone, which may be owing to its property of dissolving the phosphat of lime. The excellent effects of vinegar, when immediately applied to burns and scalds, have been taken particular notice of by Mr. Cleghorn, a brewer in Edinburgh, who communicated his sentiments to Mr. Hunter. He recommends the immediate application of vinegar, which is to be continued, for some hours, by any the most convenient means until the pain abates. Should it return, the vinegar is to be repeated. In cold weather, Mr. Cleghorn directs the vinegar to be made a little warm, with the view of preventing the occurrence of tremblings, and chillness, which are sometimes induced when applied quite cold.

ACIDUM SULPHURICUM. *Sulphurick Acid. Oil of Vitriol.*

Sulphur combines with oxygen in different proportions; when united with the largest proportion, it forms an acid extremely powerful from its state of concentration, the sulphurick acid. This acid used to be obtained from the decomposition of sulphate of iron, the green vitriol of commerce, by heat; and hence the name of vitriolick acid which was given to it. It is now formed by the combustion of sulphur. The sulphur reduced to powder is mixed with from one eighth to one tenth of its weight of nitrate of potass, by which its combustion when begun can be continued without the free access of atmospherick air, the nitrick acid of the nitrate affording the requisite quantity of oxygen. It is thus burnt in a large leaden chamber; the sulphurick acid, which is slowly formed, is absorbed by water placed in the bottom of the chamber; the acid liquor is concentrated by exposing it to heat in glass retorts, and the pure sulphurick acid is obtained. It is of a thick consistence, and has an apparent unctuosity; its specifick gravity is 1850; when pure, it is colourless and transparent. It strongly attracts water, which it imbibes from the atmosphere very rapidly, and in large quantities, if suffered to remain in an open vessel. If it be mixed with water, it produces an instantaneous heat, nearly equal to that of ebullition. Its action is very strong upon all the earths, except the siliceous; upon the alkaline salts; upon many metals; and almost every other combustible substance. It is highly corrosive; and in fine, possesses all the general acid properties in an

eminent degree. When sufficiently diluted, this acid is an excellent tonick, and its astringency is considered as superiour to that of any other acid. It is therefore used in hæmoptysis, menorrhagia, diabetes, hectick, and dyspepsia. From its refrigerant and antiseptick properties, it is a valuable medicine in many febrile diseases, especially those called putrid. Checking fermentation, exciting appetite, promoting digestion, and quenching thirst, it is exhibited with success in acidity, weakness, and relaxation of the stomach. If taken in a considerable quantity, or for any length of time, it seems to pass off undecomposed by the kidneys or skin; and it is perhaps by its stimulant action on the latter, that it is advantageously employed in psora and other cutaneous affections. In its concentrated state, its dose cannot be measured. In the pharmacopœias therefore, it is ordered to be kept diluted. The best mode of prescribing it, is to mix the quantity of acid to be used, with as much water as will render it palatable, to which some syrup or mucilage may be added. To prevent it from attacking the teeth, it may be conveniently sucked through a quill, and the mouth should be carefully washed after each dose. From its astringent powers, this article is generally added to gargles, which are employed to check salivation, or relieve inflammatory affections of the uvula, and apthous mouths. According to Dr. Sims, and others, experience has demonstrated the superiour efficacy of sulphurick acid when freely administered, as a remedy in *Scarlatina Anginosa*.

Mixed with lard, in the proportion of half a drachm to an ounce, it has been used externally with advantage in cutaneous affections and ill conditioned ulcers. The different combinations of this acid, and the processes in which it is employed, will be found under the head of preparations.

Acipenser Sturio. *Ichthyocolla. Isinglass.*

This substance is obtained from the skin and other parts of the sturgeon, as well as several other kinds of fish caught in the northern seas.

The internal skin is boiled in water; the strained decoction is inspissated; and the solid mass formed into convoluted pieces is the isinglass of the shops. The sounds or air-bladders of fresh water fish, in general, are

the most transparent, flexible, and delicate substances, and consequently furnish the finest isinglass. The preparation of isinglass is almost peculiar to Russia. It is made in all places where the large species of acipenser or sturgeon are caught; that prepared from the sturgeon is reckoned the best. It varies in quality according to the mode of preparation. The best is usually rolled into the form of a snake or heart; the second folded in leaves like a book; and the worst is dried without any care.

Good isinglass is white, in some degree transparent, dry, composed of membranes, not too thick, and without smell. The properties of isinglass depend entirely on the gelatin of which it principally consists. One hundred grains of good isinglass were found by Mr. Hatchett to contain rather more than ninety-eight of matter soluble in water.

A watery solution of it is used as a test of the presence of tannin, and for the clarification of spirituous liquors. Mr. Davy's solution for the former purpose consists of one hundred and twenty grains of isinglass dissolved in twenty ounces of water; and if properly made, it has a tendency to gelatinate, at temperatures below 50° F.

In a medical view, isinglass is but seldom employed. When boiled in fresh milk to the consistence of a strong jelly, it affords a very nourishing food to invalids; though it should be eaten with precaution by those who possess a weak stomach, or digest slowly; as it has a great tendency to turn rancid and putrid. It is said to be employed for the preparation of English court plaster, a solution of it being spread on black silk.

As the sturgeon abounds in the rivers of the United States, and the demand for isinglass is extensive and yearly increasing, it is highly important that the attention of our citizens should be turned to the preparation of it. And it fortunately appears that a new domestick source for this article has lately been discovered. Mr. Daniel Waldron of Westchester county, N. Y. has discovered that the *vesicula natatoria* of a certain fish, frequent on the coast of New York and of the United States, affords a true isinglass which is capable of being employed for all the common purposes of Russian isinglass. Mr. Waldron is about obtaining a patent for his valuable discovery.

ACONITUM NAPELLUS. *Large blue Wolfsbane. Monkshood. Aconite.* The herb and root.

This is an exotick perennial, growing wild in the mountainous parts of Switzerland and France. It is frequently cultivated in gardens in this country. The characters which distinguish the several species of aconite are so obscure as to occasion considerable confusion. The species used in medicine called monkshood has long spikes of large blue flowers, and three capsules to a flower. The leaves are many, cleft with linear divisions, broadest at top, and marked with a line running along them. The juice of this plant possesses a disagreeable smell and an acrid taste: of the latter, however, it is in a great measure divested by inspissation. The fresh leaves have very little smell, but when chewed have an acrid taste, and excite lancinating pains, and swelling of the tongue. By drying, their acrimony is almost entirely destroyed. For medical use the root must be gathered before the stem shoots. Being one of the most violent vegetable poisons, when taken in large doses it excites sickness, vomiting, diarrhœa, giddiness, delirium, fainting, cold sweats, convulsions and death. Yet on many occasions it has been found a very effectual remedy in glandular swellings, venerial nodes, anchylosis, spina ventosa, itch, amaurosis, gouty and rheumatick pains, intermittent fevers, and convulsive disorders. When properly administered, it acts as a penetrating stimulus, and generally excites sweat, and sometimes an increased discharge of urine. It is commonly used in the form of an inspissated juice. As soon as the plant is gathered, the juice is expressed, and evaporated without any previous clarification, to the consistence of an extract. It is an unfortunate circumstance, that the powers of this medicine vary very much, according to its age; and the heat employed in its preparation. When recently prepared, its action is often too violent, and when kept more than a year, it becomes totally inert. It may therefore be laid down as a general rule, in the employment of this and many other similar active medicines, to begin with very small doses, and to increase them gradually to the necessary degree; and, whenever we have occasion to begin a new parcel of the medicine, we should again commence with the smallest dose, and proceed with the same caution as at first.

We may begin with half a grain of this extract, either formed into a powder with white sugar, or made up with any convenient addition into a pill, twice or thrice a day, and gradually increase the dose: or a tincture of aconite may be prepared, by digesting one part of the dried leaves in six parts of spirits of wine; the dose of which will be at first five or ten drops, and may be gradually increased to forty.

A decoction of the roots of this plant affords an efficacious liquor for destroying *bugs*, and will prove fatal to rats and mice.

Acorus Calamus. *Sweet flag.* The root.

The common calamus aromaticus, or sweet flag, grows in marshy situations, and in shallow water, and may be known by its long sword shaped leaves, resembling those of the flag, but narrower, of a brighter green, waved along one of the edges, and also its oblong, cylindrick spike of flowers coming from the side of the stem at the edge of the leaf. The root is like that of the flag, long, cylindrick, tuburous, spongy, marked with rings, and putting out abundance of fibres, which, indeed, are the proper roots. It has a strong aromatick smell, and a warm, pungent, bitterish taste. The flavour is greatly improved by drying.

It possesses carminative and stomachick virtues, and is frequently grated into water and given to children for pain in the stomach and bowels from flatulence. This root is also used as an ingredient in the morning bitters in this country, particularly in places subject to ague.

According to Bechstein, the leaves may be employed for dispelling many noxious insects; hence they are recommended against moths, infesting woollen cloth, and the destructive worms in books; for which purpose they might every year be replaced in the corners of the drawers and shelves. Mr. Bautroh has used the whole plant for tanning leather; and Dr. Bohmer remarks, that the French snuff, called *a la violette*, probably receives its peculiar scent from this fragrant root.

Actea Spicata. *Herb Christopher.* The root.

This vegetable is perennial, growing in woods and shady places. It attains the height of about two and a

half feet, and flowers in the months of May or June; and produces black, shining, pulpy berries in Autumn, about the size of peas, which are considered as poisonous. On account of its fœtid smell, this plant is said to be frequented by toads.

There are two varieties of this plant in the United States; one of which is thus described by Rev. Dr. Cutler, "Christopher baneberries. Blossoms white, berry red. In woodland and shady places—May. The berries are exceedingly poisonous. Dr. Withering says, the plant is powerfully repellent; and that the root is useful in some nervous cases, but it must be administered with caution." Actea racemosa, says Dr. Mease, (Dom. Encyclop.) black snake root, or rich weed, is a very beautiful plant when in flower. The utility of the root of this plant is well known. It is an astringent; and Dr. Barton says, it was used in the form of decoction as a gargle, with success, in a putrid sore throat, which prevailed in New Jersey, many years ago. A decoction of the root cures the itch. In North Carolina, it has been useful as a drench in the disease of cattle, called the murrain.

Æsculus Hippocastanum. *Horse chesnut.* The seed and bark.

This is a very common and well known tree. The fruit is principally farinaceous, and produces excellent starch, and has been used for food for domestick animals, and even for men in times of scarcity. But its introduction into the Edinburgh pharmacopœia was probably owing to its having been used and recommended as a sternutatory in some cases of ophthalmia and headache. With this view it was drawn up the nostrils, in the form of an infusion or decoction. The bark has been proposed as an indigenous substitute for the very expensive and often adulterated Peruvian bark. Many successful experiments of its effects, when given internally in intermittent and typhus fever, and also when applied externally in gangrene, sufficiently warrant future trials. In powder, it may be given to the extent of a scruple and a half, or a drachm, for a dose. It rarely disagrees with the stomach; but its astringent effects generally require the use of some aperient medicine. Some species of æsculus are cultivated in the United States, on account of the beauty and agreeable shade of the tree. Medical knowledge might be promoted

were practitioners to try the efficacy of the bark of our native species.

Agrimonia Eupatoria. *Agrimony.* The root.

This is a native of the United States. The number of stamina from five to twelve. Blossoms on long terminating spikes; yellow. By fences—July. It is said the Indians used an infusion of the roots in inflammatory fevers with great success; and, according to Kalm, the Canadians have great confidence in it for the same purpose. The leaves of this vegetable are said to be aperient, detergent, and to strengthen the tone of the viscera; hence they have been used in laxity of the intestines, in scorbutick, and other disorders arising from debility. Digested in whey, agrimony affords a diet-drink grateful to the palate and stomach, and was formerly supposed to be an effectual remedy for the jaundice.

The leaves and stalks, together with the closed flowers, afford a dark yellow decoction, which when previously impregnated with a diluted solution of bismuth imparts a beautiful and permanent gold-colour to animal wool.

Alcohol. *Ardent Spirit. Spirit of Wine.*

This product is formed during the process of vinous fermentation of sugar dissolved in water, or of saccharine matter in the state in which it exists in sweet vegetable juices. It is the basis of all vinous and ardent spirits, and gives them their peculiar properties—pungency, spirituous flavour, and intoxicating power. It was the opinion of Lavoisier that access of the air to the saccharine matter, was unnecessary to fermentation; and that the water present, was not decomposed, but that the changes, by which alcohol is formed, arise from the immediate reaction of the elements of the saccharine matter, and of the new combinations through which they may pass. These elementary principles, he conceived to be carbon, hydrogen and oxygen. This theory has not been found to be strictly true. In order to excite fermentation in a solution of pure sugar a certain quantity of what is called ferment, is necessary; and sweet vegetable juices undergo this process only from naturally containing this substance. The nature of this ferment has not been explained in a satisfactory manner. It appears to resemble

gluten or albumen in its composition; and in particular contains nitrogen; which Thernard supposes enters into the composition of alcohol. This opinion is corroborated by the analysis of Saussure, which gives the proportion of the elements of alcohol thus, 43,65 carbon, 37,85 oxygen, 14,94 hydrogen and 3,52 nitrogen. It still remains uncertain what proportion of oxygen and hydrogen exists in alcohol in their elementary state, and what in the state of water. The whole of this subject requires further investigation.

The method of obtaining *spirit* of *wine* or *alcohol* is by submitting the fermented liquor to distillation. It is distilled over with a quantity of water, and thus forms the vinous and spirituous liquors of commerce; these deriving their peculiar flavour from the substances from which the fermented liquor has been prepared. From these liquors alcohol is procured in a more concentrated state by repeated distillation; different substances being added to facilitate the concentration and rectification. The process belongs to pharmacy. Pure alcohol is a colourless transparent fluid; its odour is fragrant, but its taste highly pungent. Its specifick gravity is in proportion to its degree of concentration, but as it is usually prepared it is, 835. When of the common strength, it is so volatile as to evaporate speedily at the common temperature; it boils at 160° Fahrenheit, and takes fire when raised to 300°. Alcohol exerts chemical affinities to a number of substances. It unites with water in every proportion; equal quantities of which, by weight, form proof spirits (alcohol dilutum) which is extensively used as a menstruum. It dissolves the pure alkalis. several neutral salts, sulphur and phosphorus; it is likewise the solvent of many of the immediate vegetable principles, as resin, camphor, essential oil, balsam, extract and saccharine matter.

Alcohol is a powerful and highly diffusible stimulant. Taken in moderate quantities it raises the circulations, adds vigour to the muscular system, and exhilarates the mind, but these are followed by proportional languor. If the quantity be considerable, a palsy or apoplexy follows, which frequently ends in death.

It is considered a good application to recent burns, and to inflammations not connected with increased action, and also, with friction, to relieve muscular pains. It is used to excite action in the vessels to prevent passive

hæmorrhage. Alcohol is, however, seldom employed in its pure state, but extensively in the form of vinous and ardent spirits. The wines are more permanent in their stimulant effect than the ardent spirits; hence they are superiour in their tonick power, but inferiour in producing sudden stimulus.

The spirituous liquors in small quantities prove a powerful cordial, and for a time a strengthening beverage, giving vigour to the stomach, promoting digestion, and preventing flatulence. To the weakly and relaxed they are highly useful by giving elasticity and firmness of tone; but to the rigid habit they are equally pernicious, producing dryness of fibre, and hastening the approach of old age.

From the long continued use of alcohol many diseases have their origin, as dyspepsia, hypochondriasis, visceral obstructions, chronick inflammation of the liver, and gout; morbid states probably arising either from the increased action it excites, giving rise to organick derangements, or from the exhaustion of power, general or local, produced by its stimulant operation.

Aletris Farinosa. *Star-grass.* The root.

This is a native plant, and is found in woods and pastures, and is called also shaw root. The naked stem rises to 16 or 18 inches, bearing on its summit a cluster of whitish mealy flowers in July. At the basis of the stem are five or six spear shaped leaves spreading out in the form of a star. The root is much valued by the common people as an efficacious stomachick. In loss of appetite, weakness of stomach, and indigestion, the root of star-grass is very successfully employed, and by many practitioners highly esteemed. In the southern states it has acquired considerable repute as a remedy in dropsical affections. The root may be given in powder or decoction to almost any extent.

Allium Sativum. *Garlick.* The root.

Garlick is a perennial, bulbous rooted plant, all the parts of which, but more especially the roots, have a strong, offensive, very penetrating and diffusive smell, and an acrimonious taste. It is a powerful and diffusive stimu-

lant; hence in cold phlegmatick habits, in rheumatalgia, catarrhous disorders of the breast, asthma, both pituitous and spasmodick, flatulent colicks, hysterical and other diseases proceeding from laxity of the solids, garlick is eminently serviceable, proving expectorant, diuretick, and if the patient be kept warm, sudorifick. Sydenham extols it in hydropick cases; and assures us also, that, among all the substances which occasion a derivation or revulsion from the head, no one operates more powerfully than garlick applied to the soles of the feet. In hot bilious constitutions, where there is already a degree of irritation, where the juices are too thin and acrimonious, this stimulating medicine is obviously improper, and never fails to aggravate the distemper. Garlick may be exhibited in substance, several cloves of it cut into slices may be swallowed without chewing. In this manner it has been successfully directed for the cure of intermittent fever; but the most commodious form for administering it, is that of bolus or pill; the expressed juice, or even the infusion, is too acrimonious for common use. Cotton, moistened with the juice, and introduced within the ear, five or six times in a day, has afforded relief in deafness proceeding from atony or rheumatism. In the form of ointment applied externally, garlick is said to resolve and discuss indolent tumours; and when applied under the form of poultice to the pubes, it has sometimes proved effectual in producing a discharge of urine, when its retention has arisen from want of due action of the bladder.

ALOE PERFOLIATA. *Aloes.* The gum-resin.

a. Aloe hepatica—Hepatick aloes.
b. Aloe socotorina—Socotorine Aloes.

A perennial plant consisting of many varieties, which grows in the south of Europe, Asia, Africa, and America. The various kinds of aloes differ in their purity, and likewise in their sensible qualities. The *socotorine* is considered as the purest, and is brought from the island of Socotora, wrapped in skins. It is in small pieces of a reddish brown colour, with a purplish cast; when reduced to powder, of a bright golden shade. Its taste is bitter, accompanied with an aromatick flavour; the smell is not unpleasant, and slightly resembles that of myrrh. The *Barbadoes* aloes is in large masses, of a lighter colour,

and has an odour much stronger, and more unpleasant than the former. The *hepatick* is of a similar kind. The *caballine* or horse aloes, is still more impure, and is weaker in its power. They are all the inspissated juice of the several varieties of the aloe plant. They consist of gum and resin, the former being in larger quantity. The smell and taste reside principally in the gum, as do the principal virtues of the aloes. Aloes is a warm, stimulating purgative, used principally to obviate costiveness. Its medium dose is from five to fifteen grains; nor does a larger quantity operate more effectually. Its operation is exerted upon the large intestines, principally on the rectum, and hence its purgative effect is slow and moderate. It has been supposed that the stimulant action of aloes may be extended to the uterus, whence it is also used as an emmenagogue; but its exhibition is deemed improper during pregnancy. It has also been supposed, that its use is apt to induce or aggravate hæmorrhoidal affections, and with those liable to such complaints, it can seldom be employed. In dry bilious habits, aloes proves injurious, immoderately heating the body, and inflaming the bowels. In small doses frequently repeated, aloes cleanses the stomach and bowels, attenuates and dissolves viscid juices in the remoter parts, quickens the circulation, warms the habit, and promotes the uterine and hæmorrhoidal fluxes. It is particularly serviceable to persons of a phlegmatick temperament and sedentary life, and where the stomach is oppressed and weakened. Taken in doses of a few grains, mixed into pills, with a third or equal parts of soap, it acts as a gently stimulating laxative, and if continued, is capable of removing very obstinate obstructions. On account of its bitterness, aloes has been supposed to kill worms, either taken internally, or applied in the form of plaster to the umbilical region. Dissolved in alcohol, it is also employed for restraining external hæmorrhages, and for cleansing, and healing wounds and ulcers.

Dr. Hamilton, in his excellent work on purgatives recommends aloes in typhus fever, scarlatina, cynanche maligna, marasmus, chlorosis, chorea, hysteria and tetanus.

ALTHÆA OFFICINALIS. *Marsh Mallow.* The root and leaves.

The marsh mallow is a handsome perennial indigenous plant growing in salt marshes and on the banks of rivers and other wet places. It is also cultivated in gardens for its medical virtues. The upright cylindrical stem rises to three or four feet; is somewhat branched and cottony. The leaves are on leaf stalks, egg-spear shaped, obscurely lobed, serrated, and have a soft woolly surface, feeling like velvet. The flowers appear in August, from the bosom of the leaves on fruit stalks in a kind of panicle, and are of a white or pale flesh colour. Every part of the marsh mallow, and especially the root, upon boiling, yields a copious mucilage; on account of which, it is frequently employed in emollient cataplasms, and by way of infusion. In humid asthma, hoarseness, dysenteries, and likewise in nephritick and calculus complaints, it is of eminent service; as by lubricating and relaxing the vessels, it procures a more easy passage to the stagnant fluids. It is with equal advantage applied externally, for softening and maturating hard tumours; and when chewed, it is said to afford relief in difficult teething. An ointment and syrup are made from the roots of this plant.

AMMONIACUM. *Ammoniacum.* A gum-resin.

This gum-resin is brought from Egypt, and the East Indies; the tree which produces it is unknown. It comes in large masses, or, when of the best quality, in small round fragments, yellow on the surface, and white within. It has a faint smell, and a nauseous taste. It contains nearly half its weight of resin, which is dissolved by alcohol. Triturated with water, it forms a milky like mixture. The general action of gum ammoniack is stimulant. On many occasions it proves a valuable antispasmodick, deobstruent, or expectorant. In large doses it purges gently, excites perspiration, and increases the flow of urine. It is prescribed for removing obstructions of the abdominal viscera, and in hysterical complaints, occasioned by a deficiency of periodical evacuations, and

in long and obstinate colicks, proceeding from viscid matter lodged in the intestines. But it is no less frequently resorted to as an expectorant, in cases where the lungs are oppressed with tenacious phlegm, as in asthma, and chronick catarrh. In this last disease, if the cough continue dry and husky, without expectoration, and fatigue the breast, provided there be no apprehension of tubercles, there is not, perhaps, a more efficacious remedy for it, than half a drachm of gum ammoniacum, with twenty drops of liquid laudanum, made into pills, taken at bed time, and occasionally repeated. This excellent remedy was recommended by sir John Pringle; and Dr. Mudge observes, that he has in many instances found it very successful, and generally expeditious; almost uniformly producing expectoration, and abating the distressing fatigue of the cough. This gum, combined with squills, is used as a diuretick in dropsical affections, in doses from ten to thirty grains. Externally, it is applied as a discutient, under the form of plaster, to white swellings of the knee, and to indolent tumours.

AMOMUM ZINGIBER. *Ginger.* The root, and the candied root brought from India.

Ginger is a perennial shrub, which grows about three feet high, indigenous to the East Indies, but now cultivated in the West Indies. It is in small wrinkled pieces, of a grayish, or white colour, having an aromatick odour, and a very pungent, and even acrid taste. The black ginger, is the root prepared with less care than the white, which, previous to drying, is scraped and washed. Ginger yields its active matter completely to alcohol, and in a great measure to water. This root is frequently employed as a grateful and moderately powerful aromatick, either in combination with other remedies, (to promote their efficacy, and obviate symptoms arising from their operation,) or by itself, as a stimulant, particularly in dyspepsia, flatulence, tympanites, and gout. This spicy root is more immediately serviceable in cold flatulent colicks; in laxity and debility of the stomach and intestines, and especially in torpid phlegmatick constitutions, in order to induce a more brisk action of the

vessels. Candied ginger is prepared in India, from the young and succulent roots. When genuine, it is almost transparent.

AMOMUM REPENS. *Lesser Cardamom.* The seeds.

The seeds of this plant are dried and imported from India in their capsules, by which their flavour is better preserved. Their smell is aromatick; their taste pungent. They are used merely as grateful aromaticks, and are frequently combined with bitters. These seeds are said to possess this advantage over the pepper species, that notwithstanding their pungency, they do not immoderately heat, or inflame the bowels.

AMYGDALUS COMMUNIS. *The Almond Tree.* The kernel of the fruit, such as is called sweet almond.

The almond tree is eminent, both for its fruit, and for the ornament it affords to a shrubbery. It is much cultivated in the south of Europe. Sweet almonds are supposed to afford but little nourishment, and are not easily digested, unless thoroughly comminuted. The oil is obtained by expression from the seeds, or by decoction. It is very similar to olive oil, but more pure, and is given to blunt acrimonious humours, and to soften and relax the solids; hence its use internally in tickling coughs, heat of urine, pains and inflammations; and externally, in tension and rigidity of particular parts. There is another mode in which this oil is given as a demulcent; that of emulsion. The almonds are triturated with water; the oil they contain is diffused in the water, by the medium of the mucilage of the almond, and a milky like liquor is formed, which is extensively used as a pleasant demulcent.

There is no apparent difference between the trees which produce the sweet and bitter almonds, and very little betwixt the kernels themselves; and it is said that the same tree has by a difference in culture afforded both. Bitter almonds have been found poisonous to dogs and some other animals; and a water distilled from them when made of a certain degree of strength,

has had the same effects. Nevertheless, when eaten they appear innocent to most men, and are every day used in cookery on account of their agreeable flavour; but there are some habits in which the smallest quantity produces urticaria, and other unpleasant symptoms. The similarity of the smell induced Mr. Schrader to suppose that bitter almond contained prussick acid and he verified his conjecture by analysis. Since that time it has been found, that this acid exists, but in a particular state in all the bitter poisonous vegetables, and that in its pure state it is eminently poisonous. (See prussick acid in this volume.)

AMYRIS GILEADENSIS. *Balsam of Gilead Tree.* The liquid resin, called Balsam of Gilead.

This is a resinous juice, obtained from an ever-green tree, growing spontaneously, particularly near Mecca, on the Asiatick side of the Red Sea. This balsam, procured by incisions made in the trunk of a tree, is highly fragrant, and is so much valued in the East, that it is said not to be imported into Europe. A coarser kind is met with, obtained by strong decoctions of the branches and leaves, and adulterated by various mixtures. This is of a yellow colour, and thick consistence; its taste is warm and bitter; its flavour somewhat fragrant. The medicinal virtues of the genuine Balsam of Gilead, have been very highly rated, undoubtedly with much exaggeration. But the real opobalsam, or Balm of Gilead, frequently mentioned in scripture, is not to be obtained in its genuine state, as it is presented only to sovereign princes: nor need it be regretted, since it is now entirely superseded by the balsams of Canada and Copaiba, which are equally efficacious.

ANETHUM FŒNICULUM. *Fœniculum dulce.* Sweet fennel. The root and seeds.

This is a perennial plant, of which there are four varieties. One of these, the common fennel, is indigenous on chalky cliffs in England. The sweet fennel, the variety of which is officinal, grows wild in Italy, but is also culti-

vated in gardens. It is smaller in all its parts than the common, except the seeds, which are considerably larger. The seeds of the two sorts differ likewise in shape and colour. Those of the common are roundish, oblong, flatish on one side, and protuberant on the other, of a dark, almost blackish colour; those of the sweet are longer, narrower, not so flat, generally crooked, and of a whitish or pale yellowish colour. The seeds of both the fennels have an aromatick smell, and a moderately warm pungent taste: those of the *fœniculum dulce* are in flavour most agreeable, and have also a considerable degree of sweetness. The seeds yield an excellent aromatick oil, which is carminative, resolvent, and diuretick, without heating the body.

ANETHUM GRAVEOLENS. *Dill.* The seeds.

Dill is an annual umbelliferous plant, cultivated in gardens, as well for culinary as medical use. The seeds are of a pale yellowish colour, in shape nearly oval, convex on one side, and flat on the other. Their taste is moderately warm and pungent; their smell aromatick, but not of the most agreeable kind. The seeds are recommended as a carminative in flatulent colicks.

These seeds, with those of cummin, possess qualities and virtues similar to those of the annis and caraway, and are used for similar purposes, but are scarcely entitled to a place in the materia medica. Cummin however affords an oil peculiarly grateful to wild pigeons, and is frequently resorted to by the people in the country as a lure for those birds to the stand of the gunner.

ANGELICA ARCHANGELICA. *Garden Angelica.* The roots, stalks, leaves, and seeds.

Angelica is a large biennial umbelliferous plant. It grows spontaneously on the banks of rivers in alpine countries. It has been found in England, but it is doubtful whether it be indigenous. For the use of the shops, it is cultivated in gardens in different parts of Europe. The stalk of this magnificent plant, when properly cultivated in a moist soil, rises to the height of seven or eight feet; its flowers are of a greenish white colour, or some-

times yellow. Every part of this useful vegetable, the root, stalk, leaves, and seeds, partake of the aromatick properties, and were formerly supposed by European physicians to be well calculated to strengthen the solids, and especially serviceable for dispelling flatulency, removing pectoral complaints, and affording effectual relief in hystericks. Dr. Duncan says, angelica is one of the most elegant aromaticks of European growth, though little regarded in the present practice. Among the several species of angelica in the United States, we have *Angelica Sylvestris*, or wild angelica, which is a much smaller plant, of a thinner and less succulent stem than the former. It grows in marshy woods and in hedges, flowers in June or July. This species however, possesses, but in an inferiour degree, the medicinal properties of the preceding. Being warm and aromatick, it is frequently employed in flatulent colicks, and its stems are sometimes candied by the country people. The leaves of wild angelica yield a good yellow colour to wool properly prepared by a solution of bismuth.

Angustura. *Angustura.* The bark.

This is a bark imported within these few years from the Spanish West Indies; the botanical character of the tree producing it is unknown. It is in flat pieces, externally gray and wrinkled; internally, of a yellowish brown, and smooth; has little flavour; its taste is bitter, and slightly aromatick. Water, assisted by heat, takes up the greater part of its active matter, which does not seem to be injured, even by decoction. Alcohol dissolves its bitter and aromatick parts, but precipitates the extractive matter, dissolved by water. Proof spirit is its most proper menstruum. Angustura is a powerful antiseptick. It was originally introduced in the West Indies, as a remedy in fevers, equal, or even superiour, to the Peruvian bark. As an aromatick bitter, it has been found to be a tonick and stimulant of the organs of digestion. It increases the appetite, removes flatulence and acidity arising from dyspepsia, and is a very effectual remedy in diarrhœa, from weakness of the bowels, and in dysentery; and it possesses the singular advantage of not oppressing the stomach, as Peruvian bark is apt to do. Its dose is from ten to twenty grains of the powder, or one drachm in

infusion, or decoction. Its tincture, in a dose of one or two drachms, has been used in dyspepsia. It proves ineffectual as a remedy in intermittents.

ANTHEMIS NOBILIS. *Chamomile.* The flowers.

Chamomile is a perennial plant, indigenous to the south of England, but cultivated in gardens for the purposes of medicine. The flowers have a strong, not ungrateful aromatick smell, and a very bitter nauseous taste. Their active constituents are bitter extractive, and essential oil. To the latter is to be ascribed, their antiseptick, carminative, cordial, and diaphoretick effects; to the former, their influence in promoting digestion. Chamomile flowers are a very common and excellent remedy, which is often used with advantage in spasmodick diseases, in hysteria, in spasmodick and flatulent colicks, in suppression of the menstrual discharge, in the vomiting of puerperal women, in after pains, in gout, in intermittents, and typhus. From its stimulating and somewhat unpleasant essential oil, chamomile is also capable of exciting vomiting; and a strong infusion of the flowers is often used to promote the action of other emeticks. In substance, it has been frequently given as a remedy in intermittent fever, in a dose of a drachm, or more, three or four times in the day. Chamomile flowers are applied as a discutient and emollient, in the form of clyster or fomentation, in colick, dysentery, strangulated hernia, &c.

APIUM PETROSELINUM. *Common Parsley.* The root and seeds.

This plant is cultivated in gardens for culinary purposes. The root is of a sweetish taste, slightly pungent and aromatick. The seeds have an aromatick flavour and are occasionally used as carminatives. Parsley was long retained in dispensatories and supposed to possess diuretick properties, but has not been much employed in modern practice; recently however, its valuable properties have been satisfactorily ascertained. Professor Chapman of Philadelphia says, "Every part of this plant is actively diuretick, but an infusion of the roots is generally used. I have prescribed the seeds with equal advantage.

No diuretick is more valuable in some cases than this. It has done good in dropsy; and I have cured a case of asistes with it which had been twice tapped. It is still better adapted to the ordinary suppressions of urine, to strangury from blisters and to painful micturition from nephritis, and what increases its value is its being retained under all circumstances of the stomach."

APOCYNUM ANDROSÆMIFOLIUM. *Dogs Bane.* The root.

This is a handsome, smooth, branching plant, common among thickets and about the sides of fences. The stem rises to two or three feet, smooth simple below, branching repeatedly at the top, red on the side exposed to the sun. Leaves opposite, ovate, acute, entire. Flowers appear in June and July on the ends of the branches in nodding cymes, of a pink or purplish white, bell shaped. The plant is perennial and abounds with a milky juice. The fruit is a pair of long slender follicles containing numerous seeds furnished with down. The root is intensely bitter, and in large doses operates well as an emetick; it is much employed for that purpose by country physicians and has received the name of *Ipecac.* The recently powdered root is given in doses of thirty grains which is said to evacuate the contents of the stomach as effectually as two thirds the quantity of ipecacuanha. The medicine is much impaired in its strength by keeping. Professor Bigelow, by whose authority this article is now introduced, informs us that we have very few indigenous vegetables which exceed the apocynum in bitterness, and thinks the sensible and chemical qualities of the root promise a good effect when given in small doses as a tonick medicine to the stomach.

AQUA. *Water.*

Pure water is defined, a liquid, transparent, colourless, insipid substance. By a moderate degree of cold, it is converted into a solid, transparent body, called ice; and at a temperature of 212° of Fahrenheit's thermometer, it becomes rarefied, is augmented in bulk, and quickly dispersed in the form of vapour. It is diffused through the atmosphere, and over the surface of the globe; and

exists in a certain proportion, in animals, vegetables, and minerals. Till the latter end of the eighteenth century, it was generally believed to be a simple element; and the late discovery of its being a compound, is considered as one of the most important and astonishing, that has been made since the origin of chemical science. By a variety of chemical experiments, the fact has been demonstrated beyond controversy, that water consists of 85 parts of oxygenous, and 15 of hydrogenous gas.

All natural waters are more or less impure; having a strong attraction for different substances, they imbibe part of them in every situation in which they are found. Water cannot be obtained in a pure state, without undergoing the process of distillation. Its salubrity depends on the peculiar properties which it possesses. Some waters are strongly impregnated with animal, vegetable, or mineral particles, which render them unfit for culinary purposes. Pure water has neither smell, nor taste, and is perfectly transparent. If water be of a brown colour, some extraneous substance is diffused through it; if of a green colour, it indicates the presence of iron; and, if blue, that of copper. If, on agitation, air-bubbles appear in the water, and if it have a mild sourish taste, we may be sure that it contains carbonick acid gas, or fixed air.

Atmospherick water comprehends *rain* and *snow water;* the former is that which was evaporated from the sea and land, dissolved in the air, and afterwards discharged on the earth. It would be as pure as distilled water, if the atmosphere did not abound with vapours and exhalations, capable of combining with it. The rain, which is collected from the roofs of houses in large cities, is always mixed with soot, animal effluvia, and other impurities. *Snow water* is contaminated with the same impurities as rain water, and it is probably from the want of common air, or of carbonick acid, that snow water is injurious to health.

River water may be considered as a compound of spring and rain water. Near great cities, particularly, it is blended with a number of impurities; but by the process of filtration, it becomes fitted for every purpose of life; and it is preferred for brewing, or forming malt-liquor. It is also more or less wholesome according to the particular strata it flows over; as from a sandy or stony soil it attracts less impurity than from a soft muddy one; and the more rapid its course, the sooner it frees itself from

those adventitious particles which taint its natural wholesomeness.

Spring water is a compound of sea water changed by subterraneous heat, and of the vapours of the atmosphere. It is, indeed, always impregnated more or less with mineral substances, which must be noxious to a certain degree. But, like river water, the strata through which it rises, must in a great measure regulate its qualities.

Well or *pump water*, is much of the same nature with spring water, but it generally receives a fuller or more complete filtration from the manner in which it is procured. Where the filtration is through a sandy soil the water is purest, and the more frequently a well is emptied, the less chance there is of the water acquiring a putrid taint by stagnation.

Stagnant waters, as those of lakes, swamps, and ditches, are the most unwholesome of any, as they both collect impurities from their situation, and acquire from their want of motion a disposition to putrescency; and they are the fruitful source of contagion.

Water is an essential constituent in the organization of all living bodies; and as it is continually expended during the process of life that waste must be also continually supplied; and this supply is of such importance, that it is not left to reason, or to chance, but forms the object of an imperious appetite. Experience clearly evinces that it is the most healthy and natural beverage of mankind; and, as the basis of all drinks, deserves the title of a universal remedy more than any other substance with which we are acquainted. It is the most powerful solvent of alimentary matter we possess; and without it, neither life nor health could be maintained. Nor is it less powerful in disease, especially as a diluent in febrile affections. In fine, where custom has not altered the constitution of man, it forms the most salubrious of all drinks, and those, who have made it their constant and only beverage, have enjoyed a constant health, a flow of spirits, and a length of life, superiour to all others. As a medicinal agent in the various forms of its application to diseases, water is highly deserving the attention of practitioners. When taken into the stomach, water acts by its temperature, its bulk, and the quantity absorbed by the lacteals. The colder it is, the more tonick and invigorating it proves; while warm water is on the contrary the most sedative and debili-

tating of drinks. Water about 60° gives no sensation of heat or cold; between 60° and 45° it gives a sensation of cold, followed by a glow and increase of appetite and vigour; below 45° the sensation of cold is permanent and unpleasant, and it acts as an astringent and sedative; above 60° it excites nausea and vomiting, probably by partially relaxing the fibres of the stomach, for when mixed with stimulating substances it has not these effects. In the stomach and in the intestines it acts also by its bulk, producing the effects arising from the distension of these organs; as the intestinal gases consist of hydrogen gas, either pure or carbonated, or sulphuretted, or phosphuretted, it is probably in part decomposed in them. It likewise dilutes the contents of the stomach and intestines, thus often diminishing their acrimony. It is absorbed by the lacteals; dilutes the chyle and the blood; increases their fluidity; lessens their acrimony, and produces plethora. Its effects in producing plethora and fluidity are however, very transitory, as it at the same time increases the secretion by the skin and kidneys. Indeed the effects of sudorificks and diureticks depend in a great measure on the quantity of water taken along with them.

When spring waters possess any peculiar character they are called *mineral waters;* and these, as having a specifick action depending on the foreign substances which they contain, will be more particularly investigated and considered in the appendix of this work.

Some water, possessing the quality of hardness, does not readily dissolve soap, nor boil vegetables soft, nor make an infusion of tea. It generally contains some acid, combined with an absorbent earth, for which the acid has less attraction than for the alkali of the soap. When soap is put into such water, its alkali is immediately attracted by the acid, the soap is decomposed, and the oil swims on the surface.

From the influence of the animal and vegetable substance which it contains, water is extremely liable to become putrid on long voyages; in this state it is in a high degree pernicious to the human frame, and capable of producing mortal diseases, even by its effluvia. Various expedients have been devised to keep it in a state of purity. Dr. Butler has found, that four ounces of fine clear pearl ash, dissolved in one hundred gallons of water, and the casks closed in the usual manner, have proved effectual for preserving water perfectly sweet during a

voyage of eighteen months. The same desirable object may be attained, by adding a small portion of vitriolick acid and of alkali to every cask; which will preserve the water in a pure and salubrious state, for at least twelve months. Charcoal has also proved to be eminently adapted to such purpose. With this view the inner surface of the staves are charred previously to constructing the casks. Putrid water may be restored to its original purity, by adding to each gallon ten grains of calcined alum, and twenty-five or thirty of powdered charcoal; both ingredients, however, ought to be preserved in close vessels, otherwise their efficacy will be considerably diminished. The same purpose may be effected, according to the experiments of Mr. Lowitz, by charcoal and vitrolick acid: one ounce and a half of charcoal in powder, and twenty-four drops of vitriolick acid, are sufficient to purify three pints and a half of corrupted water, and do not communicate to it any perceptible acidity.

Putrid water may be restored to its original purity, by filtering it through sand and charcoal. Several filtering machines have been invented admirably calculated to facilitate this process; and repeated experiments have demonstrated their great utility.

ARALIA SPINOSA. *Prickly-ash. Toothache tree.* The bark, root, and berries.

This is a native of Virginia, and other southern states. The height to which this tree will grow, when the soil and situation wholly agree with it, is about twelve feet. It is a very ornamental shrub, and the stem which is of a dark brown colour is defended by sharp prickly spines. A decoction of its bark and root has often succeeded, when taken internally, in removing rheumatick complaints. It excites a gentle perspiration. The berries are used to put into a hollow tooth when aching. A tincture of them is also used for the same purpose, both of which afford relief. In Virginia a spirituous infusion of the berries is much esteemed in violent colick.

ARBUTUS UVA URSI. *Bearberry. Bear's Whortleberry.* The leaves.

This plant has formerly been imported from Europe by our druggists, but it abounds throughout the New England states, and in New York and New Jersey. It is found in

woods and on mountains, in a sandy soil, and is known to the inhabitants by the name of wild cranberry. It is a low evergreen shrub. Stems long and woody, trailing over the ground, and forming extensive beds. Flowers in small bunches, drooping, rose coloured, in June. Berries red, remaining long on their stalks; they are insipid, pulpy and mealy. The leaves impart an astringent quality to the taste, followed by a bitterness. So great is their astringency that they are in Russia used for the purpose of tanning leather. A watery infusion of the leaves immediately strikes a very black colour with chalybeates. The uva ursi has long been known in medicine for its astringent and tonick powers, and has obtained considerable reputation for the cure of various affections of the urinary organs depending on debility. Dr. de Haen, of Vienna, has bestowed very high encomiums on the uva ursi, as a remedy in ulcerations of the kidneys, bladder, and urinary passages. He represents it as capable of curing almost every case of that kind; and even asserts, that in cases of calculus, much benefit is derived from its use; patients after the employment of it, passing their urine without pain. In many affections of the urinary organs, this medicine has in our country proved to be a remedy of considerable efficacy; and it has been particularly serviceable in alleviating dyspeptick symptoms in nephritick and calculous cases. In diabetes, and in ulcerations of the kidneys and bladder, it has often been employed with decided good effects. Professor Barton, late of Philadelphia, from long experience of its efficacy, was high in its commendation in cases of nephritis depending on gout, and has found it serviceable in old gonorrhœa; and in gleet he employed it successfully by way of injection. From its astringency, this article has been employed in menorrhagia and in leucorrhœa; and Dr. Bourne, of Oxford, in England, gave it to abate hectick fever and frequency of the pulse in pulmonary consumption. It is sometimes exhibited in the form of decoction, but most frequently in that of powder, from twenty to thirty grains, three or four times a day. Dr. Ferriar has experienced very beneficial effects from uva ursi in nephritick cases, and even in smaller doses than usual. He exhibited five grains of the leaves and half a grain of opium, three or four times in a day, according to the urgency of the symptoms, which he found always to relieve, and generally to effect a cure. In some instances it was employed

for several months together before this was attained. In several cases of hematuria in delicate females, where the hæmorrhage evidently proceeded from the kidneys, uva ursi always succeeded in removing the complaint. Dr. F. is of opinion that this remedy acts specifically as a tonick and astringent on the kidneys. He always prefers small doses, as a scruple or half a drachm often produces nausea, even when joined with opium. This gentleman has also discovered in uva ursi the property of preventing or curing that distressing strangury which is sometimes produced by the application of blisters. It has in his hands and others proved an effectual remedy if given during the application of the blister, or after the strangury has come on. For medicinal use the green leaves alone should be selected and picked from the twigs, and dried by a moderate exposure to heat.

ARCTIUM LAPPA. *Burdock.* The root and seeds.

This is a common plant about way-sides, sufficiently known from its scaly heads or burs, which stick to the clothes. It bears purplish blossoms in July and August. The seeds have a bitterish subacrid taste: they are recommended as very efficacious diureticks, given either in the form of emulsion, or in powder, to the quantity of a drachm. The roots are esteemed aperient, diuretick, and sudorifick; and are said to act without irritation, so as to be safely used in acute disorders. Decoctions of them have of late been employed in rheumatick, gouty, and venereal disorders, and are by some preferred to sarsaparilla.

ARGEMONE MEXICANA. *Prickly Poppy.*

We are indebted to Solomon Drown, M. D. an accomplished botanist, of Rhode Island, for the following account and description of a plant lately introduced into his garden.

This fine American plant has a singular appearance, with its spinous leaves deeply indented, and streaked with white; its prickly stems and calyx; its yellow solitary flowers, and spinous capsules. It abounds with a milky glutinous juice, turning in the air, into a fine bright yellow, and not distinguishable from gamboge; said to be

efficacious, in small doses, in dropsies, jaundice, and cutaneous eruptions; deemed to be very detersive, and used in diseases of the eyes; the infusion is sudorifick and resolutive; the seeds are a stronger narcotick than opium, and frequently administered in the sugar colonies in diarrhœas and dysenteries. In the West Indies it is called the yellow thistle. This appears to be a hardy annual, and without doubt can be cultivated easily in the United States.

Argentum. *Silver.*

This metal is distinguished by its pure white colour, its high degree of lustre, and its great ductility and malleability. It is not very susceptible of oxidation; it does not suffer that change from exposure, even in a state of fusion, to the atmosphere. Those acids which yield oxygen readily oxidate and dissolve it, particularly nitrick acid, which is hence employed as its usual solvent. The solution, when evaporated, affords the nitrate of silver in a crystalline form.

Aristolochia Serpentaria. *Virginia Snake Root.*

The root.

A perennial medicinal plant, and a native production of the United States exclusively. The root consists of a number of small strings of fibres, matted together, issuing from one head, of a light brown colour, having a slightly aromatick smell and a pungent bitterish taste. This root is a warm stimulant, both diaphoretick, and diuretick, and esteemed one of the principal remedies in malignant fevers to support the powers of the system. It increases the pulse very perceptibly, and is improper whenever bleeding is required. It is given in substance in doses of from twenty to thirty grains, and in infusion to a drachm or more, or it may be administered in tincture, its active matter being entirely extracted by proof spirit. By decoction, its powers are entirely destroyed. This root promotes the efficacy of cinchona in the cure of intermittents, and remittents, and is a remedy of considerable power in dyspepsia. Combined with *calamus aromaticus*, and infused in spirits, or water, it forms the common morning dram in aguish situations. The snake root is

found to be exceedingly efficacious in checking vomiting and tranquillizing the stomach, particularly bilious vomitings from cholera morbus or any other cause. A table spoonful of the infusion every ten minutes. Externally it is used as a gargle, in putrid sore throat.

ARTEMISIA ABROTANUM. *Southernwood.* The leaves.

ARTEMISIA SANTONICA. *Wormseed.* The top and seeds, and essential oil.

ARTEMISIA ABSINTHIUM. *Common Wormwood.* The leaves and flowering heads.

The two former of the several species of artemisia, are still regarded as articles of the materia medica, although no important effects are expected to result from any medicinal virtues which they may possess. The seeds of santonica have a faint disagreeable smell and a very bitter taste. They have long been held in estimation as anthelmintick; the dose, half a drachm or a drachm of the powder, for an adult. They are given to children in powder, to the extent of ten grains or half a drachm, in the morning, when the stomach is empty; and when continued for several days, a proper cathartick is administered. The *absinthium*, or *common wormwood*, is a perennial herb, growing wild on the road sides, and is cultivated in gardens. It flowers in August; the smell of the leaves is strong and disagreeable; their taste intensely bitter. The active constituents of this plant are bitter extractive and essential oil. It is used in stomach complaints, and is of great service to hypochondriacks. It is also employed in intermittent fevers, in cachectick and hydropick affections, in jaundice, and against worms. According to Dr. Withering, an infusion of the leaves is a good stomachick, and, with the addition of fixed alkaline salts, proves a powerful diuretick in some dropsical cases.

Their ashes produce a purer alkali, than most other vegetables. The essential oil, is used both externally and internally, for destroying worms. The herb, being an excellent antiseptick, is often employed in fomentations, to resist putrefaction; and if the plant be macerated in boiling water, and repeatedly applied to a bruise, by way of cataplasm, it will not only speedily remove the

pain, but also prevent the swelling and discolouration of the part.

ARUM TRIPHYLLUM. *Dragon root. Indian turnip. Wake robbin.*

A native and hardy perennial, growing in shady places, ditch banks and swamps. Early in the spring it pushes up a one leafed conical shaped spatha, under hedges and among bushes; within this spatha, is a spadix, naked on the under part, covered with germs at the bottom, and with anthers in the middle. As the plant advances the spatha opens, and discovers a club shaped spadix, varying from yellowish green to fine purple or red. This gradually decays, and leaves a cluster of round red berries, which, as well as the rest of the plant, are very hot and biting. The leaves are generally spotted with black spots, and sometimes with white streaks, which has occasioned the vulgar name of lords and ladies. The root is bulbous, resembling in shape a small turnip, and in a fresh state is extremely acrid. When dried and pulverized, these roots lose all their acrimony, and afford an almost tasteless farinaceous white powder. In this state it is perfectly inert, but the roots may be preserved fresh for a year by burying them in a cellar in sand. Arum is doubtless a very powerful stimulant, and by promoting the secretions, may be advantageously employed in cachectick and chlorotick cases, in rheumatick affections, and other complaints of phlegmatick and torpid constitutions; but particularly in a relaxed state of the stomach, occasioned by a prevalence of viscid mucus. It has been very beneficial in asthma, especially in old people; in croop and in hooping cough. The dried root boiled in milk, in the proportion of one root to a half pint, has been advantageously employed in consumption. Some acrimony should be perceptible to the tongue and throat in its exhibition. It never affects the general circulation, says Dr. Mease, but acts solely on the parts just named; to the glands of which it is a powerful stimulus, causing a copious secretion of mucus. In chronick rheumatism, and other disorders, requiring the full effect of this medicine, great care should be taken, that the root be fresh and newly dried; and to cover its intolerable pungency, Dr. Lewis advises it to be administered in the form of emulsion, with gum arabick and spermaceti, increasing the

dose from ten grains to upwards of a scruple two or three times a day. In aphthous sore throat this root is a remedy of approved efficacy. The common method of employing it is to mix about one drachm of the finely pulverized root into a paste with honey, a small quantity of which, being put upon the infant's tongue, will be licked to all parts of the mouth. This being frequently repeated, will keep the mouth moist, clean and comfortable, and promote a separation of the aphthæ.

The French manufacture from the arum root, when properly dried and reduced to powder, a harmless cosmetick, which is sold at a high price under the name of cypress powder. A fine sago has been prepared from the roots, in the proportion of one part to four of the root, freed from its exteriour coat.

ASARUM EUROPÆUM. *Asarabacca.* The leaves.

This is a perennial plant, which is the natural produce of some places in England; although the dried roots are generally brought from the Levant. The root is fibrous, of a gray-brown colour externally, but white within. Both the roots and leaves have a nauseous, bitter, acrimonious, and hot taste; their smell is strong, but not very disagreeable. Asarabacca contains a portion of the same acrid principle with arum; and it also loses much of its activity, by decoction, or long keeping. Given in substance, from half a drachm to a drachm, it evacuates powerfully, both upwards and downwards. Linnæus proposed it as a substitute for ipecacuan; and according to Dr. Cullen, the powdered root proves, in a moderate dose, a gentle emetick. But the principal use of this plant, among modern practitioners, is a sternutatory, being the strongest of all the vegetable errhines, not excepting white hellebore itself. Snuffed up the nose, in the quantity of a grain or two, it causes a large evacuation of mucus, and raises a plentiful spitting, which sometimes continues several days together; and by which headache, toothache, ophthalmia, as well as some paralytick and soporifick complaints, have been effectually removed. Several species of asarum have been found to grow in the United States; as the Canadian asarum, and the asarum Virgineum, or sweet scented asarum or cat's foot. The Canadian asarum called also wild ginger and snake-root, is found plentifully in old woods and mountainous tracts in different parts of the country. This

plant presents only two kidney shape leaves with their stalks above the ground and an obscure flower in their fork resting on the surface or buried under the decayed leaves and soil. Dr. Bigelow is of opinion that this species of asarum possesses no emetick properties, but is to be considered as a warm stimulant and diaphoretick similar to aristolochia serpentaria, and may serve as a substitute for ginger in common domestick use.

ASCLEPIAS TUBEROSA. *Decumbent swallow-wort. Pleurisy root. Butterfly-weed.* The root.

This species of swallow-wort is one of our most beautiful perennial plants, flourishing best in a light sandy soil, by the way side, under fences, and near old stumps in rye fields, &c. It abounds in the southern states, but with us is not so frequently found. There are sometimes fifteen or twenty, or more stalks, the size of a pipe stem, proceeding from one root, rising from one to two feet in height, and spreading to a considerable extent, generally in a decumbent position. The stalks are round and woolly, of a reddish brown colour on the sun side; the leaves stand irregularly, and are spear, or tongue shaped, with a short foot stalk, and covered with a fine down on the under surface. The umbels are compact at the extremities of the branches, and formed like the common silk weed, but differing from it in the colour of the flowers, being of a beautiful bright orange colour, while those of the silk weed are of a pale purplish hue. The flowers appear in July and August, and are distinguished by their size and brilliancy from all the flowers of the field. These are succeeded by long slender pods, containing the seeds, which have a delicate kind of silk attached to them. This is probably the only variety of asclepias that is destitute of a milky juice. The root is spindle, or carrot shaped, of a light brownish colour on the outer surface, white, coarse, and striated within. The root of this plant is a valuable addition to our materia medica, having been found to possess medicinal virtues of no inconsiderable importance. It has been long celebrated in Virginia and the Carolinas, as a remedy in pleurisy, and in pneumonick affections in general. It is said to display a remarkable power of affecting the skin, inducing general and plentiful perspiration without heating the body. In the form of decoction it often induces a diaphoresis when

other medicines have failed to produce that effect. We have the testimony of professor Barton in favour of the great efficacy of this medicine in pulmonick affections. He corroborates the account published by Mr. Thompson Mason, of Virginia, whose experience of its virtues in pleurisy has been so extensive as to establish its reputation. After the use of an antimonial emetick and the loss of some blood, he gives his patients about half a drachm of the root finely powdered in a cup of warm water, and repeats the dose every two hours until the patient is perfectly recovered. which happens frequently in three days. Mr. Mason asserts that by those simple means he has cured hundreds, and never failed in a single instance. The powdered root frequently acts as a mild purgative, but it is particularly valuable for its virtues as an expectorant, diaphoretick, and febrifuge, and in this respect its efficacy is amply confirmed by the testimony of Dr. Benjamin Parker, of Bradford, Massachusetts, from his own observation during an extensive practice for many years in Virginia. From the successful employment of the pleurisy root for twenty-five years, this respectable physician has imbibed such confidence, that he extols it as possessing the peculiar, and almost specifick quality of acting on the organs of respiration, powerfully promoting suppressed expectoration, and thereby relieving the breathing of pleuritick patients in the most advanced stage of the disease; and in pneumonick fevers, recent colds, catarrhs and diseases of the breast in general, this remedy has in his hands proved equally efficacious. He directs it to be given in the form of strong infusion, a tea-cup full every two or three hours. By many families in the country this root has long been esteemed as a domestick medicine, resorted to for the relief of pains in the stomach from flatulence and indigestion, hence the vulgar name of *wind root*, by which it is known in some parts of the country, and from its colour it is by some called white root. It is said that by a perseverance for several weeks in the use of about one drachm of the powdered root every day, the lost tone of the stomach and digestive powers has been restored.

To the foregoing testimony we have the satisfaction to add the the experience and observation of professors Chapman of Philadelphia, and Bigelow of Boston, in favour of this medicine as an efficacious diaphoretick, producing its effects without increasing much the force of

the circulation, raising the temperature of the surface or creating inquietude and restlessness: well suited to excite perspiration in inflammatory diseases after the reduction of action by bleeding. It very much relieves the oppression of the chest in recent catarrh, and is unquestionably an expectorant in protracted pneumonias. Professor Bigelow asserts that it exerts a mild tonick effect as well as stimulant power on the excretories, and if given in large quantities in infusion and decoction, it operates mildly on the alimentary canal. He is satisfied of its utility as an expectorant medicine, having seen no inconsiderable benefit arise from its use as a palliative in phthisis pulmonalis. He cites an instance of a young physician who in pulmonary consumption made great use of the decoction of this root, finding it facilitated expectoration and relieved the dyspnœa and pain in the chest more than any other medicine.

This plant is well deserving a place in every garden, its ornamental appearance, and medicinal utility, will richly compensate the cultivator. I have this season had the satisfaction of examining a plant of twenty-nine stalks, more than two feet high, spreading like a potato hill, the branches handsomely crowned with elegant orange coloured flowers, and constantly visited by large brilliant butterflies.

Other species of swallow-wort, it is highly probable, as suggested by professor Barton, will be found on trial to possess medicinal virtues, and they ought to arrest the attention of physicians in the country, until they become familiarized to the specifick character, and properties of this valuable class of American plants.

Dr. Cutler describes another species, *asclepias syriaca*, or common silkweed, often called also milkweed, from its abundance of milky juice. The leaves are spear or tongue shaped, larger than the preceding, and in August its aggregate, reddish, or purple blossoms, are exhibited at the extremities of the branches, and axillæ of the leaves. The seeds are contained in large oblong pods, and are crowded with down extremely fine and soft, resembling silk, which has occasioned the name of silk weed. This substance has been mixed with cotton and spun into candle wicks. The stalk of this species is from three to six feet high, the leaves large, standing on short foot stalks. A milky juice exudes from the stems or leaves when broken. The root, as soon as it penetrates the earth, shoots

off horizontally, and often sends out other stalks. The large roots are cortical and ligneous. It abounds near fences on the road side in all parts of the country.

Dr. Abijah Richardson, of Medway, Massachusetts, has been induced to try the effects of this species. He gave the cortical part of the root in powder, one drachm in a day, in divided doses, and also in strong infusion. An asthmatick patient was much benefited by its use. In one case of typhus fever with catarrhal affection of the throat and bronchiæ, it rendered the expectoration more copious, and the matter thicker and more digested. In both cases it had an anodyne effect, the patients were relieved from pain, from dyspnœa and cough, and expectoration became easier and sleep more refreshing.

ASTRAGALUS TRAGACANTHA. *Goatshorn.* The gum called gum tragacanth.

Gum tragacanth is the product of a very thorny shrub, which grows on the island of Candia and some other places in the Levant. It is obtained by oxidation; it comes in small wrinkled pieces, semi-transparent and brittle, has neither taste nor smell, and is entirely a pure gum. It is greatly superiour to all the gums in giving viscidity to water. Its solution is not perfectly uniform, unless boiled for some time. Tragacanth has virtues similar to gum arabick, and is principally employed as a demulcent to blunt acrimonies, and as a pharmaceutick agent.

ATROPA BELLADONNA. *Deadly night-shade.* The leaves.

The deadly night-shade is a perennial branching plant, two or three feet high, growing spontaneously in gloomy lanes and uncultivated places. The leaves are ovate, entire. The flowers come out among the leaves singly, on long peduncles, in June and July. The corolla is of a dusky brown colour, on the out side, and of a dull purple within; the stalks have a tinge of the same colour, as have also the leaves towards autumn. The berry is round, green, changing to red, and when ripe of a shining black, and not unlike a black cherry in size and colour. It contains a purple juice of a mawkish sweetness, which stains paper of a beautiful and durable purple. The whole of this plant is a strong poison of the narcotick kind; and children have frequently been enticed to eat

the berries at their peril. The symptoms excited, are a dryness of the mouth; a trembling of the tongue; a very distressing thirst; difficulty of swallowing; fruitless endeavours to vomit; and great anxiety about the præcordia. Delirium then comes on with gnashing of the teeth and convulsion. The pupil remains dilated, and is not sensible, even to the stimulus of light. The face becomes tumid, and of a dark red colour. The jaws are frequently locked; inflammation attacks the stomach and intestines; mortification and death succeed. The body soon putrifies, swells, and becomes marked with livid spots; and the stench is insupportable. The best method of cure is, to excite vomiting as soon as possible, to evacuate the bowels by purgatives and clysters, and to give largely, vinegar, honey, milk, and oil. Yet this virulent poison, under proper management, may become an excellent remedy. Besides a very remarkable narcotick power, it possesses considerable influence in promoting all the excretions, particularly by sweat, urine, and it is said by saliva; but its exhibition requires the greatest caution; and when dangerous symptoms occur, its use must be suspended for some time, and afterwards resumed in smaller doses.

Deadly night-shade has been exhibited in several febrile diseases, in obstinate intermittents, in inflammations and gout; in comatose diseases, palsy, and apoplexy; in spasmodick diseases; in chorea, epilepsy, melancholy and mania; in cachectick affections, in dropsies and obstinate jaundice; in local diseases; in amaurosis; in schirrus and cancer. Belladonna is supposed by some German authors, to possess properties adapted to the prevention and cure of hydrophobia in doses from two to six grains; and it is said to have proved useful in tick douloureux.

Belladonna is best exhibited in substance, beginning with a very small dose of the powered leaves, or root; such as the fourth or eighth of a grain for children, and one grain for adults; to be repeated daily, and gradually increased. The water infusion is also a powerful remedy; one scruple of the dried leaves are infused in ten ounces of warm water, and strained after cooling. At first two ounces of this may be given daily to adults, and gradually increased, until the tension of the throat shows that it would be dangerous to go farther. In this manner Dr. Cullen has repeatedly experienced its efficacy in cancerous affections. Externally the powdered leaves are applied as a narcotick to diminish pain in cancerous and

other ill conditioned sores. Belladonna is now employed for the purpose of dilating the pupil to facilitate the operations on the eye. The extract is to be diluted with water to the consistence of cream, and dropped into the eye, or the extract undiluted may be smeared over the eye lid and brow. In half an hour, or an hour, the pupil is fully dilated, and the application should be then washed off. (Dorsey's Surgery.)

The fatal effects of the deadly night-shade is effectually counteracted by the juice of the arrow root plant. Six slaves in the West Indies swallowed some spirits from a bottle which had been stopped with the leaves of belladonna. Four of them died shortly after, by the effects of the poison. The remaining two were saved by applying liberally the juice of the young plant of maranta arundinacea. (See Address on the botany of the United States, by Jacob Green, A. M.)

Several species of this class of plants are found growing spontaneously among us. One of these has a ligneous stalk which with the leaves are armed with sharp prickles. The corolla is white, the anthers yellow.

The *garden night shade* has a branched herbaceous stalk, unarmed, and is annual. It is a common weed on dunghills, in gardens and other richly cultivated places. The fruit stalks are lateral, hanging midway between the leaves. The flowers grow on a sort of nodding umbel; the corolla is white from July to October, and the berries, when ripe, are of a shining black, and about the size of black cherries. Dr. Withering says, from one to three grains of the leaves of garden night shade infused in boiling water, and taken at bed-time, occasions a copious perspiration; increases the secretion by the kidneys, and generally purges more or less the following day. These properties, judiciously applied, render it capable of doing essential service in several diseases. But its effects on the nervous system are so uncertain, and sometimes so considerable, that it must ever be administered with the greatest caution. The leaves, externally applied, abate inflammation, and assuage pain. And in inflammations and swellings, bruises, &c. in horses, the application of these leaves has proved of great utility.

Aurum. *Gold.*

This metal was formerly supposed to possess medicinal properties, but its preparations have been expunged from

modern pharmacopœias as being considered unfriendly to the human constitution, or devoid of efficacy as a remedy in disease.

In a publication printed at Paris in 1811, by Dr. J. A. Chrestien, of Montpelier, the medical faculty are again invited to investigate the properties of gold. The author proposes a preparation of this metal as a new remedy for the treatment of venereal and lymphatick disorders. His numerous experiments on the anti-syphilitick powers of the preparations of gold, have greatly elated his hopes, and rendered him so sanguine as to affirm, that their efficacy is equal if not superiour to that of mercury, that they are capable of effecting a radical cure of the varied forms of this disease, without producing salivation, or any derangement of the functions of the body, and that no season, no temperament, and no complication of the disease can create any obstacle to their efficacy.

Of the above assertions we are not left destitute of corroborative evidence.

Doctors Seaman and Pascalis, of New York, have experienced the anti-syphilitick virtues of the preparations of this metal, and their observations, so far as they have extended, are in confirmation of the opinion of Dr. Chrestien.

Gold may be employed, for this purpose, in the state—1. Of minute division. 2. Of oxide. 3. Of oxide in combination with ammonia. 4. Of oxide in combination with oxide of tin. 5. Of muriate.

The first of these, denominated by the author, "*Or metallique divise*," was prepared by forming an amalgam of gold and quicksilver, and afterwards withdrawing the latter by exposing the compound to the rays of the sun concentrated by a convex lens, to the heat of a fire, or to the action of nitrick acid. The gold remained in the form of an impalpable powder.

The yellow oxide of gold was obtained by precipitating it from its solution in nitro-muriatick acid by potash. The manner of effecting this he has not mentioned, and, as it will be seen below, there are some difficulties in the way of preparing it of a uniform strength. The oxide precipitated from its solution by ammonia was soon laid aside from the danger of its spontaneous explosion.

The compound oxide of gold and tin, may be obtained by mixing the solutions of these metals, or by adding

metallick tin in filings to a diluted solution of gold. He prefers the latter.

The muriate of gold, says Dr. Chrestien, procured by evaporating the solution to dryness, was so deliquescent and caustick, that I made but little use of it; but supposing a muriate with two bases might obviate these inconveniences, I combined the muriate of soda with the solution of gold, and obtained the desired product.

Numerous detailed cases are given in the subsequent part of his work on the effects of each of these preparations, in syphilis. They differ much from each other in activity, the oxides producing more speedy effects than the powdered gold, and the muriate more powerful action than the oxides. They were all administered by friction on the tongue, cheeks, or gums. The *or devise* was thus prescribed to the extent of three grains in a day; the oxide precipitated by potash in a dose of half a grain gradually augmented to two grains; the compound oxide of tin and gold in rather smaller doses; and lastly, the muriate of gold in the quantity of from one fifteenth, to one tenth of a grain. On account of the superiour activity of the latter, he found it necessary to mix it with certain substances which were capable of diminishing its energy, without abstracting its oxygen. He employed for this purpose *starch*, *charcoal*, and *painter's lac*.

From the variety of cases brought forward by the author, to prove the activity, and the anti-syphilitick virtues of gold, we collect that within a moderate time it cures chancres, warts, secondary ulcers, sore throats, and other forms of inveterate lues. This favourite remedy of Dr. Chrestien is said also to have effected important cures in cases of diseases of the uterus, of goitre, and other lymphatick diseases or obstructions; in all similar affections, therefore, it is undoubtedly deserving of trial.

It seems proper here to direct to the best mode of obtaining the preparations of this metal of a uniform strength.

Gold, in a state of minute division, may be procured with facility, by pouring into a diluted solution of this metal a solution of green sulphate of iron; a brown or bluish brown powder will be precipitated, which is metallick gold minutely divided. The best proportions of the acids to dissolve this metal, according to Vauquelinare, two parts of muriatick to one of nitrick acid. Potash and soda, and their carbonates, do not decompose the solution

at common temperatures; they merely give it a deep red colour, with a little turbidness. The red substance when dried has the appearance of dried blood. It has a styptick metallick taste, and is slightly soluble in water. It is inferred to be a compound of oxide of gold with a minute portion of muriate of gold.

To precipitate the greatest quantity of oxide from its solution, by means of the alkalis, we must manage so that no useless acid shall remain in the solution, in order that less of the triple salt may be formed; this is effected by evaporation to dryness, very cautiously conducted, the product being again dissolved in distilled water.

The compound oxide of gold and tin. or the purple powder of Cassius, may be formed either by adding the solutions of tin and gold much diluted to each other, or by immersing metallick tin in a diluted solution of gold. It is so difficult properly to prepare the solution of tin, so as always to produce the same colour and the same relative proportions in the component parts of the precipitate, that the latter method is preferable; the neutral solution of gold being diluted with one hundred parts of distilled water, and metallick tin being added to it. The formation and preservation of the muriate of gold is a work of some difficulty. The evaporation of the solution must be very carefully conducted; for the affinity between this metal and oxygen is so slight, that a moderate degree of heat is sufficient to overcome it. When therefore the temperature is high, the muriate will be decomposed, part of the gold will appear in the form of purple oxide, and part in its metallick state. When properly prepared, it has a strong attraction for moisture, it soon deliquesces, and becomes soft and even liquid.

The preparations of this metal were administered by Dr. Chrestien, by friction; but if we reason from analogy, more positive effects might be supposed to follow from its being taken internally. No difficulty would be experienced in preparing the oxide for this purpose; and the muriate might, with equal facility, be exhibited either by forming a triple muriate in the liquid form, or by dissolving the muriate of gold in a given portion of distilled water.—*Med. Repos. Hex.* 3. *vol.* 3. *N. Eng. Med. Journal, No.* 3.

We wait the issue of more extensive experience and observation to decide whether gold is entitled to all or

any part of the merit ascribed to it as a remedy, and is calculated to supersede the mercurial practice so long and so successfully established.

Avena Sativa. *Oats.* The seeds.

When deprived of their husks and formed into groats, oats are converted into an excellent dish for the infirm and diseased. When ground into meal, and boiled in water, they afford a thick and nourishing mucilage, which, with the addition of a few currants, is very wholesome, and produces a mildly laxative effect. An infusion of the husks in water, allowed to remain until it becomes acidulous, is boiled down to a jelly, which is called sowins. In these forms, oats are nutritious and easy of digestion.

Gruels or decoctions, of groats or oatmeal, either plain, acidified, or sweetened, form an excellent drink in febrile diseases, diarrhœa, dystentery, &c. and from their demulcent properties, prove useful in inflammatory disorders, coughs, hoarseness, roughness, and exulceration of the fauces.

Bismuthum. *Bismuth.*

This metal is of a white colour with a shade of yellow, has a foliated fracture, is brittle, very fusible, capable of being volatilized, and easily susceptible of oxidation. Though it has not been received into the pharmacopœias it has a claim to a place in the materia medica, as its oxide, or rather sub-nitrate, has been employed with considerable advantage in gastrodynia, pyrosis, and other affections connected with debility of the digestive organs. This preparation is obtained by decomposing the solution of bismuth in nitrick acid by the affusion of water: the sub-nitrate is precipitated, and is washed and dried. It is given in a dose from two to six grains, two grains being given twice or thrice a day, or in more severe cases, five grains given at once. In these doses it scarcely produces any other sensible effect than a remission of pain, and ultimately, a removal of the morbid state from which this has arisen.

The introduction of this remedy into practice is of recent date, but we are possessed of the most convincing

proofs of its having been successfully employed by several eminent practitioners both in Europe and the United States.

Dr. Odier, of Geneva, first introduced this mineral into practice; and Dr. Marcet, physician to Guy's hospital, London, and Dr. Bardsley of the Manchester infirmary, have experienced its medicinal powers; and Drs. Post, Osborn and Stringham of New York, have added their testimony in favour of its efficacy, as an antispasmodick, particularly in cramps and other painful affections of the stomach.

In an inaugural dissertation by Dr. Samuel W. Moore, of New York, it is the object of the author to present a knowledge of the medicinal powers of the white oxide of bismuth, and to recommend its use in gastrodynia, pyrosis, cardialgia, and other affections of the stomach connected with dyspepsia. He relates several cases of the successful employment of the remedy, and from the most unquestionable authority furnishes decisive evidence of its efficacy in the complaints abovementioned. In those affections of the stomach, whether from intemperance or other cause, which proceed from a want of tone in its muscular fibres, and where there is a disposition in that organ to generate acid, the oxide of bismuth, it is said, effects a permanent cure, when alkalis and absorbent earths afford but temporary relief.

The reviewers of Dr. Moore's dissertation in the New England Medical Journal, after duly applauding the author, thus express their opinion of the utility of the oxide of bismuth.

"The action of this substance on the stomach is that of a mild and effectual tonick; and from our own experience of its virtues, we do not hesitate to affirm with Odier, Marcet, Bardsley, and Moore, that in pyrosis, cardialgia, and more particularly gastrodynia, it operates more speedily, and with more certainty, than any other article of the materia medica. In the course of the last five years, we have frequently prescribed it in these forms of dyspepsia with almost uniform success; and although a medicine possessing such active properties might be supposed occasionally to produce some unpleasant effects on the system, we have never known any injurious consequences to result from its exhibition. A substance which discovers such qualities ought to be more generally known

and more frequently administered; for even on the supposition that it is capable of producing no greater effects than those of the medicines usually prescribed in these complaints, its use will be attended with the advantage of discarding in some measure, from practice the long continued employment of alcohol and bitters, which ultimately lessen the activity of the digestive organs, and either prolong or perpetuate the disease they were intended to relieve."

The oxide of bismuth is prepared, as recommended by Dr. M. according to the following process.

The bismuth to be dissolved should be previously reduced to powder in an iron mortar. Let three parts of nitrick acid for one of bismuth be diluted with an equal weight of pure water. To this menstruum, contained in a glass vessel, add the bismuth at intervals, and let it stand till it is all dissolved. Let the clear solution be decanted from the sediment, and a few ounces of it be poured into a glass vessel, capable of containing half as many gallons as there have been measured ounces put in; the vessel is then filled with pure (distilled) water, when a copious and perfectly white precipitate will be instantaneously formed, giving to the liquid the appearance of milk. After this has subsided, the clear fluid must be decanted, and fresh water thrown on the precipitate to wash it. This operation must be repeated several times, till no acid taste is discoverable in the decanted water. This precipitate, which is pure white oxide of bismuth, should be suffered to dry without heat, or indeed light, for the attraction between oxygen and bismuth is so weak, that if the oxide, while drying, be exposed either to a moderate artificial heat, or the direct rays of the sun, it parts with a portion of its oxygen, and loses its whiteness.

The usual dose in which this substance is prescribed is five or six grains twice or thrice a day, mixed with any convenient vehicle, such as the powder of gum tragacanth, gum arabick, sugar, or starch, in the proportion of one grain of the oxide to four or five of the powder of either of these substances. It is extremely probable that other medical properties of this valuable article are yet to be ascertained by more extensive research and experiment.

BITUMEN PETROLEUM. *Rock Oil. Barbadoes Tar.*

Bitumen is now employed as a generick name for several inflammable bodies of different degrees of consistency from perfect fluidity to that of a brittle, but very fusible solid, and of little specifick gravity.

Petroleum is a bitumen of a red colour, and thick consistence, of a disagreeable smell, and a bitter, acrid taste. In medicinal virtues, it participates of those of oil of amber, and of turpentine. It is, at present, very rarely employed as a medicine; some of the more common mineral oils being preferred. An oil extracted from a kind of stone-coal, has been extolled, under the name of British-oil, for external purposes; against rheumatick pains, paralytick complaints, and for preventing chilblains. Even this is often counterfeited, by adding a small portion of the oil of amber, to the common expressed oils.

The Barbadoes tar is found in several of the West India islands, where it is esteemed by the inhabitants of great service as a sudorifick, and in disorders of the breast and lungs; though in cases of this kind, attended with inflammation, it is certainly improper.

BUBON GALBANUM. *Loveaged Leaved Bubon.* The gum-resin, called galbanum.

Galbanum is obtained by exudation from incisions, made in the stem of a perennial plant, which grows in Africa. The best kind of galbanum consists of pale coloured pieces, about the size of a hazel nut, which on being broken, appear to be composed of clear white tears, of a bitterish acrid taste, and a strong peculiar smell. Alcohol dissolves its resin, in which its principal virtues reside. Proof spirit dissolves it entirely, the impurities excepted. Triturated with water, it forms a milky-like fluid.

Galbanum possesses the virtues of the fœtid gums, and is used for the same purposes; dose from ten grains to one drachm. It is chiefly employed in the form of plaster to white swellings, and it is supposed to resolve and discuss tumours, and to promote suppuration; but for these purposes, it is more efficacious in a liquid state. In hys-

terick spasms and inflamed hæmorrhoids, no application can afford more effectual relief, than a tincture from this gum; but in the latter case, the painful parts ought to be covered with linen rags, moistened in lime water, before the tincture is dropped upon them.

Calx. *Lime, recently burnt. Quick Lime.*

This article is a soft, white, friable substance, prepared from marble, chalk, and other calcareous earths, by the process of calcination. All calcareous earths, whether in the form of marble, lime stone, chalk, marine shells, &c. are convertible into quick lime by the action of heat.

These substances are found in a state of combination with the carbonick acid, or fixed air. During the process of calcination, the carbonick acid is expelled from the carbonates, in the state of gas or air; and the product is quick lime in a caustick state. As quick lime attracts moisture and carbonick acid from the atmosphere, it should be always recently prepared, or preserved in very close bottles for medicinal use.

Lime is soluble in water in small quantity; the solution has a styptick taste, and is the form under which lime has been medicinally employed. It is used with advantage in dyspepsia; its beneficial effects arising principally from its tonick and astringent quality, as in the small quantity which water can dissolve, it can have little effect by any chemical agency in obviating acidity. It is employed too as an astringent in chronick diarrhœa and in leucorrhœa. As a pure tonick, the product of the combination of it with muriatick acid, the muriate has been introduced into practice as much superiour in efficacy to muriate of barytes; and a formula for preparing it is given by the Edinburgh and Dublin colleges. It has been used principally in scrofula and hectick fever, and in dyspepsia. Its dose is from half a drachm to a drachm of its saturated solution; and as it is a medicine of considerable activity, it requires to be given with caution. On the living body, lime acts as an escharotick, and as such is applied to ill-conditioned sores, to soften their callous edges. Farriers are in the practice of applying lime to ulcers and other sores of horses, with much benefit, as a convenient, cheap, and useful escharotick. Lime is much used in pharmacy, for the purpose of forming lime water, and as a chemical agent in several preparations.

CANCER ASTACUS. *The Craw Fish.*

CANCER PAGURUS. *The black clawed Crab.* The claws, called crabs' eyes.

In the head and stomach of the craw fish, are found certain concretions, about the size of peas, or larger, of a white colour, and sometimes of a reddish and bluish cast. They are prepared by levigation and washing with water. They are termed *lapilli cancrorum præparati*, formerly *occuli cancrorum præparati.* The tips of the claws of the common crab, are precisely similar in composition, and are prepared in the same manner. They are named *chelæ cancrorum præparatæ.* Both these substances are carbonates of lime, free from the other earths, which chalk always contains, and therefore preferable to it for medicinal use.

CANELLA ALBA. *Canella Alba.* The bark.

This is the inner bark of the branches of a tree which is very common in Jamaica and other West India islands. It is in quills, or flat pieces, of a light brown or grayish colour; its flavour is aromatick, and its taste pungent. Canella is a moderately strong aromatick, and is employed principally on account of its flavour. It enters into the composition of several tinctures, and is scarcely applied to any other use.

CAPSICUM ANNUUM. *Cockspur Pepper.* The fruit.

This species of pepper is a native of South America, and is cultivated extensively in the West India islands. The pods are long, pointed, and pendulous, at first of a green colour, and afterwards of a bright orange red. The taste of capsicum is extremely pungent and acrimonious; setting the mouth, as it were, on fire. Its pungency is completely extracted by alcohol, and partly by water.

Cayenne pepper is an indiscriminate mixture of the powder of the dried pods of many species of capsicum. These peppers have been chiefly used as a condiment. They prevent flatulence from vegetable food, and have a warm kindly effect upon the stomach. An abuse of them,

however, gives rise to visceral obstructions, especially of the liver. Of late they have been employed also in the practice of medicine. There can be little doubt, but they furnish us with one of the purest and strongest stimulants, that can be introduced into the stomach; while, at the same time, they have nothing of the narcotick effects of ardent spirits. Dr. Adair Makitrick, who was perhaps the first that employed them as a medicine, directs them to be given to the extent of six or eight grains, under the form of pills; or in tincture, made by infusing half an ounce of the pods, in a pound of rectified spirit, and to be given from one, to three drachms in a dose. He has found them useful in a variety of affections, particularly in that morbid disposition, which he calls the *cachexia africana*; and which he considers as a most frequent and fatal predisposition to disease among the slaves. Dr. Wright says, that in dropsical and other complaints, where chalybeates are indicated, a minute portion of powdered capsicum forms an excellent addition, and recommends its use in lethargick affections.

This pepper has also been successfully employed, infused in vinegar, as a gargle in a species of cynanche maligna, which proved very fatal in the West Indies, resisting the peruvian bark, wine, and the other remedies commonly employed. The practice, though successful in the West Indies, it is said, is not without danger from the inflammation it is liable to induce.

In tropical fevers, coma and delirium are common attendants; and in such cases, cataplasms of capsicum have a speedy and happy effect. They redden the parts, but seldom blister, unless kept on too long. In ophthalmia, from relaxation, the diluted juice of capsicum is a sovereign remedy.

Carbo Ligni. *Charcoal of Wood.*

Common charcoal of wood, (carbonous oxide) or carbon of the French chemists, is a sort of artificial coal, consisting of half burnt wood. It is in the form of solid masses of a black colour, is brittle, and has neither smell nor taste. It is extremely porous, and therefore absorbs light strongly, which accounts for its blackness; for, the rays of light, striking on the charcoal, are received and absorbed in its pores, instead of being reflected, whence, the body must of necessity appear black. This substance

also attracts air from the atmosphere, which it continues to absorb for a considerable time. It is insoluble in water, and a bad conductor of calorick, but an excellent one of electricity.

This substance is found to consist of 63, 86 of carbon, and 36, 14 of oxygen.

Charcoal possesses a number of singular properties, which render it of considerable importance in many respects. It is incapable of putrifying or rotting, like wood; and so remarkable is the durability of this substance, that it may be preserved to an indefinite length of time; for there yet exists, acccording to Dodart, charcoal made of corn, (probably in the days of Cæsar,) which is in so complete a state, that the wheat may be distinguished from the rye. Besides the great advantage which this article affords to the artist and manufacturer, it has been of late employed with considerable success—First, in correcting the burnt, or empyreumatick taste in ardent spirits—Secondly, in depriving rancid oil of its disagreeable flavour—Thirdly, in restoring putrid meat. For these useful purposes, it should be previously reduced to powder, and that only used which is fresh prepared, or has been kept in close vessels, that it shall have absorbed no fixed air from the common atmosphere. The tainted flavour of ardent spirits, or the unpleasant one of those distilled from grain, may be entirely destroyed, by merely shaking it with powdered charcoal.

Charcoal is of still greater utility for purifying water on ship board. The most offensive water may be rendered perfectly sweet, by merely filtrating it through maple, hickory, or oak coal and sand. New made charcoal, by being rolled up in cloths that have contracted a disagreeable odour, effectually destroys it; and the bad taint of meat, beginning to putrify, is in like manner corrected. It is possible that meat surrounded by fresh charcoal, might keep sweet for months. On account of its absorbent and antiseptick properties, this substance promises to be of considerable service in medicine. It has been found to arrest the progress of mortification, when applied in the form of medicated poultice to the affected part, and frequently repeated. In a variety of instances it has been found to have a remarkable effect, in removing habitual costiveness, without inducing an extraordinary degree of weakness, especially if it be mixed with syrup of yellow roses. Many persons, afflicted with that disagreeable

complaint, a fœtid breath from a costive habit, have obtained effectual relief by taking two or three times in a day, a table spoonful of each of the above articles. Charcoal, made from maple wood, or burnt bread, finely powdered, makes a simple, efficacious, and safe tooth powder, which is preferable to any other. It neutralizes, and entirely destroys for a time, any fœtor which may arise from a carious tooth. It has lately been found to cure *tinea capitis*, by being sprinkled over the ulcer in fine powder.

Charcoal has been employed with good success in ulcerated state of the fauces and gums depending on a disordered stomach. It possesses tonick powers when applied to the alimentary canal, and is useful in pyrosis, in some stages of dysentery with acrid discharges, and in putrid fevers. The dose is a table spoonful of the fine powder dissolved in flour and water twice in a day. In Europe, particularly in the British army, charcoal has been employed with superiour advantages to the Peruvian bark in intermittent and remittent fevers. From half a drachm to two drachms given three or four times during the intermission, or immediately before the expected paroxysm will in most cases prove sufficient. Two or three doses have often interrupted the expected paroxysm, and cut short the disease.

The most eligible process for preparing charcoal for medicinal uses, free from all impurities and disagreeable taste, is, to enclose small billets of wood in an iron cylinder, having a tube fixed to one end, and distil them until no more smoke and water escape from the tube. Then put out the fire, and close the mouth with clay, until the cylinder cool. The barrels of old guns or pistols, may serve for this purpose; or the pieces of wood may be put into a pot not closely covered, and surrounded with live coals, until all smoke from the pot shall cease. Then remove the coals and closely lute the cover with clay, until the pot cool. Or pulverize some well burnt common charcoal, and then heat it in a covered crucible to a glowing red, till it cease to give out any inflammable vapour. It should be immediately secured in well stopped glass bottles, and in that way it may be preserved unimpaired for any length of time.

Charcoal is one of the greatest non-conductors of heat. This quality renders it applicable to a variety of econnomical purposes.

Carbonas. *Carbonate.*

Is a generick name for the combinations of the carbonick acid, with earths, alkalis, and metallick oxyds.

The nature of these substances was totally unknown until the year 1756, when the genius of Dr. Black at once removed the veil, and displayed to his contemporaries a new and immense field, in which the most important discoveries might be made; and to their ardour in cultivating it, we are indebted for the present state of chemical knowledge.

Before the brilliant epoch we have mentioned, the carbonates were supposed to be simple bodies; and the facts of their acquiring new and caustick properties by the action of fire, was attempted to be explained by supposing the particles of fire combined with them. Dr. Black, however, demonstrated by proofs that carried universal conviction along with them, that these bodies in their caustick state are simple, and that their mildness is owing to their being combined with an acid, to which the name of carbonick is now given.

The most general character of the carbonates, is their effervescing violently when any of the stronger acids are poured upon them. This phenomenon is owing to these acids displacing, by their greater affinity, the carbonick acid, which flies off in the form of gas.

The carbonates may be also deprived of the carbonick acid, either by the action of heat alone, or by heating them when mixed with charcoal, which decomposes the carbonick acid, by combining with part of its oxygen, so that both the acid and charcoal are converted into carbonick oxyd gas.

The carbonates may be divided into three great families: the alkaline, the earthy, and the metallick.

Family 1st. The alkaline carbonates have an acrimonious taste; tinge vegetable blues green, and are soluble in water, and insoluble in alcohol.

Family 2d. The earthy carbonates are insipid, and insoluble in water, but soluble in water saturated with carbonick acid.

Family 3d. The metallick carbonates scarcely differ in appearance from the metallick oxyds.

We shall have occasion immediately to notice some individuals of each of these families.

Carbonas Barytes. *Carbonate of Barytes.*

Carbonated baryta is rarely found in nature; and as it was first discovered by Dr. Withering, Mr. Werner gave it the name of Witherite.

Its colour is grayish white, sometimes inclining to milk white, and sometimes with a slight tinge of yellow. It is found in solid masses, sometimes filling an entire vein, sometimes interspersed with sulphated baryta, frequently rounded, or affecting that form, seldom crystallized. Although it has no sensible taste, it is poisonous; even in a small dose, it occasions dangerous symptoms. It is used for preparing the muriate of baryta, to which the reader is referred.

Carbonas Calcis. *Carbonate of Lime. Chalk.*

1. *Soft Carbonate of Lime, called Chalk.*
2. *Indurated Carbonate of Lime, called Marble.*

Of the two varieties of this article, the soft carbonate of lime, *Creta alba*, white chalk, is principally employed in medicine. This is a carbonate of lime found abundantly in nature; it always contains more or less argillaceous, and siliceous earths. From the grosser impurities with which it is mixed, it is freed by levigation and washing. It is then termed prepared chalk, and is very commonly employed as an antacid. As the salt it forms with the acid in the stomach, has no purgative quality, it is the one commonly employed to check diarrhœa, proceeding from acidity. It is given in a dose of one or two drachms, with the addition of a small quantity of any aromatick. In pharmacy, it is employed for the preparation of carbonick acid gas, and of the muriate of lime. Powdered chalk has been externally applied with success to scalds and burns.

Carbonas Potassæ Impurus. *Impure Carbonate of Potass, called Pearl Ashes.*

The potashes of commerce are made by reducing large quantities of wood of any kind to ashes; this process is termed incineration. The ashes, which are of a blackish

gray, or white colour, are next boiled in water so as to form a strong lixivium or ley; which, after being strained, is evaporated in an iron vessel almost to dryness. The saline matter which remains at the bottom, is then put into a crucible, and liquified over an intense heat, and poured out on iron plates, where it speedily cools, and assumes the form of concrete salt. This, however, being mixed with many impurities, is again burnt in a reverbatory furnace, and in this state, although not free from impurities, it receives the name of *pearl ashes*. This is the fixed vegetable alkali, and was formerly known in pharmacopœias under the names of sal absinthii, sal tartari, &c. and by the London college, kali. But, since the fixed vegetable alkali, from whatever vegetable it has been produced, is one and the same thing; those several terms as leading to errour, have been with justice expunged, and the new chemical term *potassa*, universally adopted.

The best vegetable alkali is obtained from weeds, the ashes of which yield a larger proportion of salt, than most kinds of wood; and among these, wormwood is said to produce the largest quantity. This kind of salt never pre-exists in the vegetable, but is always generated during the burning. These salts are acrid and caustick. They may be purified sufficiently, for pharmaceutical uses, by lixiviating them in cold water, and evaporating the ley to dryness in an iron pot.

Potassa is of extensive use in medicine, and particularly serviceable in complaints of the stomach and intestines, produced by acids. The medicinal virtues of this salt are, to attenuate the juices, resolve obstructions, and promote the natural secretions. A diluted solution of it, drank warm in bed, generally excites sweat; if that evacuation is not favoured, its sensible operation is by urine. When acidities abound in the first passages, this salt absorbs the acid, and unites with it, into a mild, aperient, neutral salt. According to the theory of Dr. Mitchell, and other respectable writers in the United States, alkaline salts, both fixed and volatile, but more especially potash and soda, are the greatest detergents, or purifiers, which are known. They are capable of resisting the dangerous progress of the septick acid, abounding in pestilential or infectious air. Hence they are employed as the principal and active ingredient in soaps, and are signally active in the form of lixivia, or leys, in cleansing

and purifying apartments in houses and ships, when infected with putrid exhalations. Alkalis, too, are the most powerful antisepticks with which we are acquainted. Potash and soda are remarkable for removing tainted and fœtid odours, and for keeping animal substances sweet, entire, and free from decay. They cleanse garments, and every thing else which is contaminated with common filth, infection, and contagion, which they neutralize, and render harmless. Alkalis are admirable remedies in fevers, and in dysentery. Administered by the mouth, they neutralize in their passage through the alimentary canal, the septick acid, which is the existing cause, and, injected in clysters, they allay tenesmus like a charm.

In both cases they mitigate pain, allay spasmodick action, and restore and equalize the peristaltick motion. They effectually destroy the fœtor and infection of the stools.

Alkalis are also excellent helps in surgery ; many foul ulcers are very much benefited by their application with the dressings, in weak, watery solution. Experiments have proved, that in foul and degenerate ulcers, of the common, as well as of the syphilitick, cancerous, and scrofulous kinds, the matter secreted on their surfaces, degenerates to a venomous acid ; the propriety of alkaline dressings, therefore, will be instantly apparent.

These and other properties of alkalis, have been treated of in Dr. Mitchell's Essays, published in the several volumes of the Medical Repository of New York ; where the reader will find a large body of evidence in favour of the antiputrefactive and antipestilential properties of alkalis, and of their virtues in curing various diseases.

The common dose of this salt is from two or three grains to a scruple, or even to a drachm. Its acrimony must, however, be sheathed with some mucilage, or largely diluted with watery liquors.

But potassa is more frequently employed in a neutralized state with the vegetable acids, to obviate irritation, to appease vomiting, and to promote diaphoresis. It has also been useful, when combined with cinchona, in intermittent fevers. The alkalis, both vegetable and mineral, have acquired much repute in the cure of pertussis. The carbonate of potash for this purpose should be given in larger doses than is generally prescribed, and duly persisted in. Potassa is extensively employed as a remedy

in stone and calculous complaints, and the acrated alkaline water is the most eligible form.

Dr. Mitchell recommends the use of potash cakes for children, to prevent the injurious effects of acidity in their stomachs, and mitigate the disorders to which their bowels are liable. He observes, that those children who have been accustomed to eat cakes, a little tinctured with this excellent ingredient, grow fat and healthy.

Carbonas Sodæ Impurus. *Impure Carbonate of Soda.*

The fixed mineral, or fossil alkali, called soda, is a very common mineral production. It is the basis of sea salt, and is found on the surface of the earth in Egypt, Syria, Barbary, &c. but the native production being found greatly inadequate to the consumption of this article, in the arts and manufactures, it is now obtained by the incineration of marine plants, especially the Spanish barilla, kali, &c. These plants, after being dried, are thrown into a deep pit, where they are burnt. When the incineration is complete, the soda is found at the bottom, caked into a solid mass. When good, it is firm, heavy, dry, sonorous, spongy, and internally of a blue colour, mixed with white spots; does not deliquesce, emits no unpleasant smell on solution, and does not leave a large proportion of insoluble matter. In medicine, this salt possesses similar virtues with the carbonate of potash, and from its crystallizability and efflorescence when exposed to the air, it is preferable to it, because its dose may be more accurately ascertained, and may be given, either in the form of powder or pills. A solution of soda is an excellent gargle for cleansing the throat, mouth, and gums, both in a sound and a diseased state; while it whitens the teeth, and dissolves all incrustations that may have been formed on their surfaces, without injuring their enamel. A small quantity of this liquid occasionally swallowed, after washing the fances, is said effectually to remove a fœtid breath. Soda is also in many instances preferable to magnesia, for correcting acidity in the stomach, and affords much relief in cases of dyspepsia and indigestion. In pertussis also it is held in estimation by some experienced physicians. It is said to act also as a tonick; and in many instances gives great relief in calcu-

lous complaints, although there can be little reliance placed upon it as a lithontriptick.

Carbonas Zinci Impurus. *Impure Carbonate of Zinc.*

This mineral is found plentifully in England, Germany, and other countries, either in distinct mines, or intermingled with the ores of different metals. It is usually of a grayish, brownish, yellowish, or pale reddish colour. This mineral, formerly called *lapis calaminaris*, is generally roasted, before it comes into the shops, to render it more easily reducible into a fine powder. In this state it is employed in collyria, against defluctions of thin acrid humours upon the eyes, and is the basis of the common healing cerate.

Carum Carui. *Caraway.* The seeds.

This is an indigenous, biennial plant, cultivated in our gardens, both for medicinal and culinary uses. On account of their aromatick smell, and warm pungent taste, the seeds of caraway may be classed among the finest stomachicks and carminatives of our climate. To persons afflicted with flatulency, and liable to colicks, if administered in proper quantities, they generally afford considerable relief, and may sometimes be used with advantage in tertian agues.

Cassia Fistula. *Cassia Tree.* The fruit.

This tree is indigenous in India and Egypt, and is cultivated in Jamaica. Its fruit is a cylindrical pod, scarcely an inch in diameter, a foot or more in length; the outside is a hard, brown bark; the inside is divided by thin, transverse, woody plates, covered with a soft black pulp, of a sweetish taste, with some degree of acrimony. This pulp, which dissolves, for the most part, both in water and rectified spirit, is a gentle laxative, and is frequently given in doses of several drachms, to persons of costive habits. In inflammatory complaints, it is sometimes administered in much larger doses, from one to two ounces, when acrid purgations are improper; though it is apt to nauseate the stomach, to produce flatulency, and griping; especially if the pulp be of an inferiour kind, or spoiled by

long keeping: these effects may, however, be obviated by the addition of aromaticks, and by taking it in a liquid form.

There are several species of cassia in the United States. Cassia marilandica is used in the southern states, as a purgative, and possesses nearly the same virtues as the senna of the shops.

Cassia Senna. *Senna.* The leaves.

This species of cassia is annual, although in its mode of growth, it resembles a shrub, and sends out hollow, woody stems, to the height of four feet. It is principally brought to us from Alexandria, in Egypt. The leaves, the only part in use, are of an oblong figure, sharp pointed at the ends, about a quarter of an inch broad, and not a full inch in length, of a lively yellowish green colour, a faint, not very disagreeable smell, and a subacrid bitterish, nauseous taste. Some inferiour sorts of this drug are obtained from Tripoli, and other places; but they may be easily distinguished, as the latter is of a fresh green colour, without any yellow shade.

Senna is a useful purgative, operating mildly, though effectually; and at the same time promoting the secretion of urine. It is always given in the form of watery infusion, two or three drachms being infused in four or six ounces of water, with the addition of a few coriander seeds, to cover its flavour, and obviate griping. It is also frequently combined with manna, with tamarinds, or with acidulous tartrite of potash, to increase its action on the bowels. By decoction with water, the activity of senna is much impaired, if not destroyed.

Cassia Marilandica. *American Senna.* The leaves.

This is a shrubby plant found in various parts of the United States, and is cultivated in gardens for medicinal use. The stalks rise to four or five feet in height, and their summits are covered in July and August with brilliant yellow flowers. The cassia marilandica possesses nearly the same virtues of the Alexandrian senna, but is inferiour to it in point of purgative properties, in the proportion of about one third. The dried leaves are employed in the form of infusion, and in a proper dose are a very useful cathartick. It is apt to occasion griping, if

given in substance, but its griping quality may in a great measure be corrected by infusing with the leaves a small quantity of the root of glycyrrhiza, or anise, and employing a large quantity of water. About half an ounce of the leaves infused in half a pint of water, is a proper dose for an adult. As this article may with facility and profit be cultivated from the seeds, it deserves a more general attention as a cheap and useful medicine.

CASTOR FIBER. *The Beaver.* The substance collected in the follicles, near the anus, called castor.

The beaver is an amphibious animal, which inhabits the northern parts of Europe, Asia, and America ; in the banks of rivers, or lakes, and at a distance from the habitations of men. Near the rectum of both sexes, there are two little bags, about the size of a hen's egg, containing a brownish oily matter, called *castor*, which is a peculiar deposition of fat, interwoven with cellular membrane. This substance has a disagreeable, narcotick smell, and a bitterish, acrid, nauseous taste. By drying it in the smoke of a chimney, it may be preserved seven or eight years. The best castor is brought from Russia, Prussia, and Poland; that procured in Canada, and New England, is of an inferiour quality. That which is very old, quite black, and destitute of smell and taste, is unfit for medicinal use.

To preserve this drug from injury, it should be kept wrapt up in bladders or oiled paper. Its active matter is dissolved by alcohol, proof spirit, and partially by water. The tincture made with diluted alcohol, is the least nauseous. Castor is an excellent antispasmodick, and acts particularly upon the uterine system. It is given with advantage in most spasmodick diseases, especially in hysteria and epilepsy. In powder, which is the most eligible form, it is exhibited in doses from ten to twenty grains, or from one to two drachms of the tincture.

CENTAUREA BENEDICTA. *Blessed Thistle.* The herb.

The carduus benedictus is an annual exotick plant, cultivated in gardens; it flowers in June and July, and produces ripe seeds in autumn.

The virtues of this plant, says Dr. Duncan, seem to be little known in the present practice. The nauseous de-

coction is sometimes used to provoke vomiting, and a strong infusion, to promote the operation of other emeticks. But excellent effects have been frequently experienced, from a slight infusion of carduus, in loss of appetite, where the stomach has been injured by irregularities. A stronger infusion, made in cold or warm water, if drunk freely, and the patient kept warm, occasions a plentiful sweat, and promotes the secretions in general.

Cera. *Wax.*

a. Flava. *Yellow.*
b. Alba. *White.*

For this useful substance, we are indebted to the common honey bee, by whom it is collected from the leaves and flowers of vegetables. It is formed into solid cakes by melting the combs, after all the honey has been expressed from them, in hot water. The best sort should be hard, compact, of a clear yellow colour, and an agreeable odour, similar to that of honey. Pure beeswax, when recent, is tough, yet easily broken; by long keeping, it becomes harder, and more brittle, loses its fine colour, and, in some measure, its fragrance.

The yellow colour of beeswax, and its peculiar smell, may be destroyed by the combined action of water, air, and the sun's rays. In the process for bleaching wax, we therefore extend its surface as much as possible, by melting it, and forming it into thin plates which are exposed to the sun's rays, and repeatedly moistened until they acquire the whiteness desired. White wax is more delicate, but in medicine, it has no advantage over yellow wax. When taken internally, wax agrees in its effects with the fat oils, and is preferable, in being less apt to become rancid. Its principal use is for the formation of cerates, ointments, and plasters.

Cerevisiæ Fermentum. *Yeast. Barm. Brewer's Foam.*

Yeast for medicinal use may be procured from the brewer's vats, or may be prepared in either of the following methods.

Thicken two quarts of water with about three or four spoonfuls of rye meal or fine flour; boil for half an hour, sweeten with half a pound of brown sugar; when near

cold put into it four spoonfuls of fresh yeast, shake it well together in a jug, and let it stand one day to ferment near the fire without being covered. Pour off the thin liquor on the top, and cork up the remainder for use.

Or, boil one pound of clean washed potatoes to a mash, when half cold, add a cupful of yeast and mix it well. It will be ready for use in two or three hours.

Or, take one pint of yeast, and add half a pint of molasses and one quart of lukewarm water. Stir these well together, and let it stand in a moderately warm place till active fermentation become evident; then it may be kept in a cool place for the patient's use. In warm weather it should be prepared fresh every day.

Yeast has acquired considerable celebrity for its virtues in the cure of putrid fever and malignant ulcerous sore throat. It is to be exhibited in doses of two spoonfuls every two or three hours; should it purge or gripe, the dose must be diminished. It is also employed as an external application to dangerous ulcers.

CERVUS ELAPHUS. *The Stag, or Hart.* The horns.

The horns of the common male, red deer, have long been considered as an article of materia medica. The scrapings, or raspings of these horns, are medicinal, and employed in decoctions, ptisans, or cooling drinks, &c. Hartshorn jelly is remarkably nourishing, and sometimes given as an agreeable demulcent, in cases of diarrhœa. The coal of hartshorn, which is prepared by exposing it to a strong and long continued fire, changes into a very white earth, called *calcined hartshorn.* It is employed as an absorbent, and likewise in dysenteries, which are supposed to arise from acrid and ill digested matter. These animal horns are to be considered of the same nature as bones; and their products by heat, are those of animal substances in general. They were formerly so much employed for the preparation of the volatile alkali (ammonia) that it was commonly called hartshorn.

CHENOPODIUM ANTHELMINTICUM. *Jerusalem Oak.* The herb and seeds.

This plant, a native of Buenos Ayres, and of various parts of the United States, is said to be an excellent ver-

mifuge. The whole plant has a powerful smell, of which it is very retentive ; the taste is bitter, with a good deal of aromatick acrimony. The whole plant may be employed. Sometimes the expressed juice is used in the dose of a table spoonful, for a child of two or three years old : more commonly, however, the seeds, emphatically called *worm-seed*, are reduced to a fine powder, and made into an electuary with syrup. Of this, the dose for a child two or three years old, is a table spoonful early in the morning. The patient is to be kept without nourishment for some hours; after supper another dose is to be administered. It is often necessary to continue this course for several days, and great numbers of lumbrici are frequently discharged, after the use of a few doses of the medicine. The essential oil of chenopodium, or worm-seed, is found to be one of the most efficacious vermifuge medicines ever employed. The dose for a child two or three years old is from two to five drops twice in a day, well incorporated with sugar or mucilage.

CHIRONIA ANGULARIS. } *Common American Centaury.*
SABATIA ANGULARIS. } The flowering heads.

"Of the centaury, we have a species, the Chironia Angularis of Linnæus, which I have reason to believe is in every respect a very superiour medicine to that which we derive from Europe. It is a very beautiful plant, growing abundantly in many sections of the United States, and affords a pure bitter, with slight aromatick flavour, which renders it rather pleasant to the taste, and grateful to the stomach. As a remedy, it is very extensively employed in our remittent and intermittent fevers, and with great success. It may be exhibited during the remission or intermission, or in any stage of the paroxysm, and therefore, in some instances, is preferable to the Peruvian bark. The usual mode of prescribing it is in strong infusion, of which copious draughts are directed to be repeatedly taken.—*Chapman's Murry.*

CICUTA MACULATA. *American Hemlock.*

This species of hemlock is not introduced on account of any medicinal virtues which it is known to possess, but that its highly deleterious properties may be more generally understood, and its fatal effects avoided. The whole

plant is a virulent narcotick poison, and several instances of fatal consequences from the roots having been incautiously eaten by children have been published. It flourishes abundantly in our low wet meadows, flowering in July and August, and is cut and and preserved among hay by our farmers, unsuspicious of its poisonous qualities. Whether domestick animals are ever the subjects of the deleterious effects of such hay has not been ascertained. Professor Bigelow describes the root of this plant as "composed of a number of large, oblong, fleshy tubers, diverging from the base of the stem, and frequently being found of the size and length of the finger. The root is perennial, and has a strong penetrating smell and taste. The plant is from three to six feet high. Its stem is smooth, branched at top, hollow, jointed, striated, and commonly of a purple colour, except when the plant grows in the shade, in which case it is green. The leaves are compound, the largest being about three times pinnate, the uppermost only ternate. Most of the petioles are furnished with long obtuse stipules, which clasp the stem with their base. Leafets oblong aruminate, serrate, the serratures very acute or mucronated. The flowers grow in umbels of a middling size, without a general involucre. The partial umbels are furnished with involucres of very short, narrow, acute leafets. The distinctness or separation of these umbels characterizes this plant at a distance among other plants of its kind, whose umbels are more crowded. Calyx of five very minute segments. Petals five, white, obovate with inflected points. Fruit nearly orbicular, compressed, ten furrowed, crowned at top, and separating into two semi-circular seeds." In professor Bigelow's medical botany are mentioned eight instances of boys poisoned by eating the root of this plant, four of whom were seized with convulsions, and three of them died within an hour and a half or one hour after swallowing it. The symptoms by which they were affected were vomiting, stupor, dilatation of the pupil, great paleness, and universal distress. Blood and froth issued from the mouth and nose, their eyes were fixed, the eye-lids in rapid motion, and these were followed by convulsions and death. "The treatment of persons poisoned by this plant, as in the case of other narcoticks, should primarily consist in a thorough evacuation of the stomach. As there commonly exists a spontaneous tendency to vomit, occasioned by the poison itself, this should

be assisted by mechanical means, by irritating the throat with the finger, or with a feather. Of emeticks, the sulphate of zinc is to be preferred on account of its speedy operation. Castor oil or infusion of senna, should be given as soon as vomiting has taken place. The vegetable acids, such as lemon juice or vinegar, have a neutralizing influence on the narcotick, and are therefore useful. Strong coffee and tea are the best antidotes for the stupor, and should be promptly administered. In violent cases, blood letting should be resorted to."

CINCHONA OFFICINALIS. *Officinal Cinchona. Peruvian Bark.* The Bark.

a. Communis. *The Common.*
b. Flava. *The Yellow.*
c. Rubra. *The Red.*

It is by no means ascertained, that the two last are the bark of the cinchona officinalis, but have been merely classed under it until we are better acquainted with their botanical history.

The tree affording this bark grows wild in the hilly parts of Peru. In the dry season, from September to November, the bark is stripped from the branches, trunk, and root, and after being carefully dried in the sun, is packed in skins. The name Cinchona, is derived from that of the lady of the Spanish viceroy, who was cured by the bark, in the year 1640. The discovery of its medicinal virtues was in all probability an accident, and on its first introduction into Europe, it was reprobated by many eminent physicians; and at different periods long after, it was considered a dangerous remedy; but its character, in process of time, became universally established.

The common pale bark is in the form of small quilted twigs, thin, breaking close and smooth, friable between the teeth, covered with a rough coat of a brownish colour, internally smooth, and of a light brown; its taste is bitter, and slightly astringent; flavour lightly aromatick, with some degree of mustiness.

The yellow Peruvian bark has only been introduced since the year 1790. It approaches more to the yellow colour than either of the others do; is in flat pieces, not convoluted like the pale; nor dark coloured, like the red;

externally smooth, internally of a light cinnamon colour; friable and fibrous; has no peculiar odour different from the others; but a taste incomparably more bitter, with some degree of astringency.

The red Peruvian bark is in large thick pieces, externally covered with a brown rugged coat, internally more smooth and compact, but fibrous; of a dark red colour, taste and smell similar to that of the pale, but the taste rather stronger. Its powder is reddish, like that of Armenian bole; its astringency and bitterness are more intense, and it contains more resin than the pale bark. It also produces its effects in smaller doses; but it is said to be more frequently adulterated.

Practitioners have differed much with regard to the mode of operation of the Peruvian bark. Some have ascribed its virtues entirely to a stimulant power. But while the strongest and most permanent stimuli have by no means the same effect with bark in the cure of diseases, the bark itself shows hardly any stimulant power, either from its action on the stomach, or on other sensible parts to which it is applied. From its action on the dead animal fibre, there can be no doubt of its being a powerful astringent; and from its good effects in certain cases of disease, there is reason to presume that it is a still more powerful tonick. To this tonick power some think that its action, as an antiseptick, is to be entirely attributed; but that, independently of this, it has a very powerful effect in resisting the septick progress to which animal substances are naturally subjected, appears beyond all dispute, from its effects in resisting putrefaction, not only in dead animal solids, but even in animal fluids, when entirely detached from the living body.

But although it be admitted that the Peruvian bark acts powerfully as an astringent, as a tonick, and as an antiseptick, yet these principles will by no means explain all the effects derived from it in the cure of diseases. And accordingly from no artificial combination in which these powers are combined, or in which they exist even to a higher degree, can the good consequences resulting from Peruvian bark be obtained. Many practitioners, therefore, are disposed to view it as a specifick. If, by a specifick, we mean an infallible remedy, it cannot indeed be considered as entitled to that appellation; but as far as it is a very powerful remedy, of the operation of which no satisfactory explanation has yet been given, it may with

great propriety be denominated a specifick. But, whatever its mode of operation may be, there can be no doubt that it is daily employed with success in a great variety of diseases.

It was first introduced for the cure of intermittent fevers; and in these, when properly exhibited, it rarely fails of success. Practitioners, however, have differed with regard to the best mode of exhibition; some prefer giving it just before the fit, some during the fit, others immediately after it. Some, again, order it in the quantity of an ounce, between the fits; the dose being the more frequent and larger according to the frequency of the fits; and this mode of exhibition, although it may perhaps sometime lead to the employment of more bark than is necessary, we consider as upon the whole preferable, from being best suited to most stomachs. The requisite quantity is very different in different cases; and in many vernal intermittents it seems even hardly necessary.

It is now given from the very commencement of the disease, without previous evacuations; which, with the delay of the bark, or under doses of it, by retarding the cure, often seem to induce abdominal inflammation, scirrhus, jaundice, hectick, dropsy, &c. symptoms formerly imputed to the premature or intemperate use of the bark, but which are best obviated by its early and liberal use. It is to be continued not only till the paroxysms cease, but till the natural appetite, strength, and complexion return. Its use is then gradually to be left off, and repeated at proper intervals to secure against a relapse; to which, however unaccountable, there often seems to be a peculiar disposition; and especially when the wind blows from the east. Although, however, most evacuants conjoined with the Peruvian bark in intermittents are rather prejudicial than otherwise, yet it is of advantage, previous to its use, to empty the alimentary canal, particularly the stomach; and on this account, good effects are often obtained from premising an emetick.

It is a medicine which seems not only suited to both formed and latent intermittents, but to that state of fibre, on which all rigidly periodical diseases seem to depend; as periodical pain, inflammation, hæmorrhagy, spasm, cough, loss of external sense, &c.

Bark is now used by some in all continued fevers; at the same time attention is paid to keep the bowels clean, and to promote, when necessary, the evacuation of redun-

dant bile; always, however, so as to weaken the patient as little as possible.

In confluent small pox, it promotes languid eruption and suppuration, diminishes the fever through its whole course, and prevents or corrects putrescence and gangrene.

In gangrenous sore throats, it is much used, as it is externally and internally in every species of gangrene.

In contagious dysentery, after due evacuation, it has been used, taken internally and by injection, with and without opium.

In all those hæmorrhagies called passive, and which it is allowed all hæmorrhagies are very apt to become, and likewise in other increased discharges, it is much used; and in certain undefined cases of hæmoptysis, some allege that it is remarkably effectual when joined with an absorbent.

It is used for obviating the disposition to nervous and convulsive diseases; and some have great confidence in it, joined with sulphurick acid, in cases of phthisis, scrofula, ill conditioned ulcers, rickets, scurvy, and in states of convalescence.

In these cases, notwithstanding the use of the acid, it is proper to conjoin it with a milk diet.

In dropsy, not depending on any particular local affection, it is often alternated or conjoined with diureticks or other evacuants; and by its early exhibition after the water is once drawn off, or even begins to be freely discharged, a fresh accumulation is prevented, and a radical cure obtained.

Mr. Pearson, of the Lock Hospital, praises very highly the powers of this remedy in different forms of the venereal disease; in reducing incipient bubo, in cleansing and healing ulcers of the tonsils, and in curing gangrenous ulcers from a venereal cause. But in all these cases mercury must also be given to eradicate the venereal virus from the system.

Peruvian bark may be exhibited,

1. In substance.

The best form of exhibiting this valuable remedy is in the state of a very fine powder, in doses of from ten grains to two drachms and upwards. As it cannot be swallowed in the form of a dry powder, it must either be diffused in some liquid, as water, wine, or milk; or mixed with some viscid substance, as currant jelly. Its taste, which is

disagreeable to some people, is best avoided by taking it immediately after it is mixed up; for by standing any time, it is communicated to the vehicle. In this respect, therefore, it is better for the patients to mix it up themselves than to receive it from the apothecary already made up, into a draught with some simple distilled water, or into an electuary with a syrup. A much more important objection to this form of giving Peruvian bark is, that some stomachs will not bear it, from the oppression and even vomiting which in these cases it excites. We must endeavour to obviate this inconvenience by the addition of some aromatick, and by giving it in small doses more frequently repeated. If we are unable to succeed by these means, we must extract the most active constituents of the bark by means of some menstruum. It has therefore long been a pharmaceutical problem, what menstruum extracts the virtues of Peruvian bark the best. But the active constituents of this remedy, according to the best and latest analysis, are bitter extractive, tannin, and gallick acid, combined with some mucilage and resin. Of these, the two last are not soluble in any one menstruum; but they most probably contribute very little to the powers of the medicine. The three other constituents, on the contrary, on which all its activity depends, taken singly, are all of them very soluble both in water and in alcohol, and in every mixture of these. But it would be contrary to analogy to suppose, that these substances should exist so intimately mixed as they must be in an organick body, without exerting upon each other some degree of chemical affinity, and forming combinations possessed of new properties. Accordingly we find, whether it arise from this cause, or merely from the state of aggregation, that neither water nor alcohol extracts these constituents from Peruvian bark in the same quantity in which they are able to dissolve them separately; and that we must have recourse to direct experiment to determine the degree of action possessed by each menstruum upon it. With this view many experiments have been made, and by very able chemists. But most of them were performed when the science of chemistry was but in its infancy; and even at this time that branch of it which relates to these substances is so little understood, that the results of the late experiments are far from conclusive.

2. In infusion.

To those whose stomachs will not bear the powder, this is the best form of exhibiting Peruvian bark. Water, at a given temperature, seems capable of dissolving only a certain quantity, and, therefore, we are not able to increase the strength of an infusion, either by employing a larger quantity of the bark, or allowing it to remain longer in contact. One part of bark is sufficient to saturate sixteen of water in the course of an hour or two. To accelerate the action of the water, it is usual to pour it boiling hot upon the bark, to cover it up, and allow it to cool slowly. After standing a sufficient length of time, the infusion is decanted off for use. The infusion in water is however liable to one very great objection, that it cannot be kept even a very short time without being decomposed and spoiled. Therefore, in some instances, we prepare the infusion with wine; and it fortunately happens that very often the use of the menstruum is as much indicated as that of the solvent.

3. In tincture.

The great activity of the menstruum in this preparation, prevents the bark from being given in sufficiently large doses to exert its peculiar virtues. It is, however, a powerful stimulant.

4. In decoction.

Water of the temperature of 212° is capable of dissolving a much larger proportion of the soluble parts of Peruvian bark than water at 60°. But the solvent powers even of boiling water have their limits, and by protracting the decoction we do not increase its strength, but rather, by diminishing the quantity of the menstruum, we lessen the quantity of the matter dissolved. Besides, at a boiling temperature, extractive absorbs oxygen rapidly from the atmosphere, and is converted into what seems to be an insoluble and inert resinous substance.

5. In extract.

In this preparation we expect to possess the virtues of Peruvian bark in a very concentrated state. The principal objections to its use are its great expense, and the decomposition and destruction of the active constituents of the bark during the preparation, when not properly conducted. It is convenient for the formation of pills, and boluses, but we would always prefer a fresh infusion or decoction to any mixture in which the extract is redissolved.

Externally, Peruvian bark is used in substance, as an application to ill conditioned, carious, or gangrenous ulcers.

In the form of clyster, it may be given in substance, decoction, or extract. The powder is used as a tooth powder for spongy and bleeding gums, and the decoction is an excellent astringent gargle or wash.

To increase the power of Peruvian bark, or to direct its efficacy to a particular purpose, or to correct some inconveniences occasionally produced by it, it is frequently combined with other remedies. When it produces vomiting, carbonick acid forms a useful addition; when it purges, opium; when it oppresses the stomach, aromaticks; and when it induces costiveness, rhubarb. It may be also combined with other vegetable astringent or bitter remedies, without impairing its powers. But we are afraid that many additions are made, chiefly saline substances, of which the effects are not at all understood. Sulphurick acid, super-sulphate of alumina and potash (alum,) muriate of ammonia, carbonate of potash, tartrite of potash, tartrite of antimony and potash (tartar emetick,) iron, lime water, &c. have been frequently prescribed with it; but we know that in many of these mixtures decomposition occurs, which renders the whole either inactive, or completely deceives us with regard to its expected effects.

In addition to Dr. Duncan's observations relative to this important article, the following taken from Murray will not be deemed superfluous.

The effects of Peruvian bark are those of a powerful and permanent tonick, so slow in its operation that its stimulating property is scarcely perceptible by any alteration in the state of the pulse, or of the temperature of the body. In a large dose, it occasions nausea and headache; in some habits it operates as a laxative; in others it occasions costiveness.

It is one of those medicines, the efficacy of which in removing disease is much greater than could be expected *a priori*, from its effects on the system in a healthy state.

Intermittent fever is the disease for the cure of which bark was introduced into practice, and there is still no remedy which equals it in power.

The disputes respecting the mode of administering it are now settled. It is given as early as possible, with perhaps the previous exhibition of an emetick to evacuate

the stomach; it is repeated in the dose of one scruple or half a drachm every second or third hour, during the interval of the paroxysm; and it may even be given with safety during the hot fit, but it is then more apt to excite nausea.

In remittent fever it is given with equal freedom, even though the remission of the fever may be obscure.

In those forms of continued fever which are connected with debility, as in typhus, cynanche maligna, confluent small-pox, &c. it is regarded as one of the most valuable remedies. It may be prejudicial, however, in those diseases where the brain or its membranes are inflamed, or where there is much irritation, marked by subsultus tendinum, and convulsive motions of the extremities; and in pure typhus it appears to be less useful in the beginning of the disease than in the convalescent stage.

Even in fevers of an opposite type, where there are marks of inflammatory action, particularly in acute rheumatism, bark has been found useful, after blood-letting.

In erysipelas, in gangrene, in extensive suppuration, and venereal ulceration, the free use of bark is of the greatest advantage.

In the various forms of passive hæmorrhagy, in many other diseases of chronick debility, dyspepsia, hypochondriasis, paralysis, rickets, scrofula, dropsy, and in a variety of spasmodick affections, epilepsy, chorea, and hysteria, it is administered as a powerful and permanent tonick, either alone, or combined with other remedies suited to the particular case.

Its usual dose is half a drachm. The only inconvenience of a larger dose is its sitting uneasy on the stomach. It may, therefore, if necessary, be frequently repeated, and in urgent cases may be taken to the extent of one ounce, or even two ounces, in twenty-four hours. In a case of mortification, Dr. Philip Syng Physick, of Philadelphia, exhibited bark to the quantity of from six to eight ounces in twenty-four hours, without its exciting any very unpleasant sensations.

The powder is more effectual than any of the preparations; it is given in wine, in any spirituous liquor, or, if it excite nausea, combined with an aromatick. The cold infusion is the least powerful, but most grateful; the decoction contains much more of the active matter of the bark, and is the preparation generally used when the powder is rejected; its dose is from two to four ounces.

The spirituous tincture, though containing still more of the bark, cannot be extensively used on account of the menstruum, but is principally employed occasionally, and in small doses of two or three drachms, as a stomachick.

The extract is a preparation of considerable power, when properly prepared, and is adapted to those cases where the remedy requires to be continued for some time. It is then given in the form of a pill, in a dose from five to fifteen grains.

When children cannot take the bark, it may be applied in the form of a quilted waistcoat with complete success.

CINCHONA CARIBÆA. *Cinchona of the Caribbean Islands.* The bark.

This species belonging to the same genus, a native of the Caribbee Islands, has been proposed as a substitute to Peruvian bark, and has, as such, been received into the Edinburgh Pharmacopœia. The bark comes in pieces about a span in length, rolled together, and a line or half a line in thickness, of a brown colour on the surface, which is most commonly covered with white moss. It has at first a sweetish taste, but after being chewed some time it becomes extremely nauseous and bitter. Dr. Wright says he made use of this bark in all cases where Peruvian bark was indicated, and with the greatest success.

CITRUS AURANTIUM. *Seville Orange.* The juice of the fruit and its external rind.

The juice of oranges is a grateful acid liquor, consisting principally of citrick acid syrup, extractive, and mucilage; of considerable use in febrile or inflammatory distempers, for allaying heat, quenching thirst, and promoting the salutary excretions;. it is likewise of use in genuine scorbutus, or sea scurvy. The china, or sweet orange, is to be preferred, as being more mild and less acid; and it is employed in its most simple state with great advantage, both as a cooling medicine, and as an useful antiseptick in fevers of the worst kind. The outer yellow rind of the fruit of the orange has a grateful aromatick flavour, and a warm bitterish taste. Both are extracted by water; and by distillation, a small quantity

of essential oil is obtained. Its qualities are those of an aromatick and bitter. It has been employed to restore the tone of the stomach, and is a very common addition to combinations of bitters used in dyspepsia. It has likewise been given in intermittents, in a dose of a drachm twice or three times a day.

CITRUS MEDICA. *Lemon Tree.* The fruit, the rind of the fruit, and its volatile oil.

The juice of lemons is similar to that of oranges, from which it differs little otherwise, than in containing more citrick acid, and less syrup. The quantity of the former is indeed so great, that the acid has been named from this fruit, acid of lemons, and is commonly prepared from it.

Lemon juice is one of the most cooling and antiseptick vegetable productions; and is of great utility in medicine. Sir John Pringle highly praises its efficacy in the sea scurvy; and it affords a grateful and cooling beverage for febrile patients; but it should be remarked, that this acid must never be freely given to persons whose breast, or respiration is effected. Citrick acid is a powerful and agreeable antiseptick. Its powers are much increased, according to Dr. Wright, by saturating it with muriate of soda. This mixture he recommends as possessing very great efficacy in dysentery, remittent fever, the dry bellyache, putrid sore throat, and as being perfectly specifick in diabetes and lienteria. Citrick acid is often used with great success for allaying vomiting; with this intention it is mixed, with carbonate of potash, from which it expels the carbonick acid with effervescence. This neutral mixture should be drunk as soon as it is made, or the carbonick acid gas, on which actually the anti-emetick powers of this mixture depend, may be extricated in the stomach itself, by first swallowing the carbonate of potash, dissolved in water, and drinking immediately afterwards the citrick acid properly sweetened. The doses are about a scruple of the carbonate dissolved in eight or ten drachms of water, and an ounce of lemon juice, or an equivalent quantity of citrick acid.

Lemon juice is also an ingredient in many pleasant refrigerant drinks, which are of very great use in allay-

ing febrile heat and thirst. Of these the most generally useful is lemonade, or elicited lemon juice, properly sweetened. Lemonade, with the addition of a certain quantity of any good ardent spirit, forms the well known beverage, punch, which is sometimes given as a cordial to the sick. The acid of lemons is a known antidote against narcotick vegetable poisons, and among these in particular against opium. It has therefore been recommended that with every dose of opium a proportion of this acid in the quantity of two ounces to the grain, should be taken, by which means the uneasiness which that drug often communicates will be prevented, and its distressing consequences avoided. Hence the use of acids, to persons who are habitually obliged to take considerable doses of opiates, cannot be too strongly recommended. To the liberal use of vegetable acids are to be ascribed the slight effects which opium possesses over the eastern nations, and not to the influence of coffee, as commonly alleged.

Either of the following methods is recommended for preserving the juice of lemons, or limes. Boil the juice after straining it, and bottle it; or squeeze the fruit; put the juice and pulp into a bottle; cover the top with an inch of oil; cork and rosin the bottle. The juice is supposed to feed upon the pulp. Before using the juice, the pulp and oil must be carefully taken out.

The yellow peel is an elegant aromatick, and is frequently employed in stomachick tinctures, and infusions; it is considerably less hot than orange peel, and yields in distillation with water a less quantity of essential oil; its flavour is nevertheless more perishable, yet does not arise so readily with spirit of wine; for a spirituous extract made from lemon peel possesses the aromatick taste and smell of the subject in much greater perfection than an extract prepared in the same manner from the peels of oranges. In the shops a syrup is prepared from the juice, and the peel is candied; the peel is an ingredient in the bitter infusions and wines; the essential oil enters the volatile aromatick spirit, or spiritus ammoniæ compositus, as it is now called, and some other formulæ.

Coccus Cacti. *Cochineal.*

Cochineal is a small, irregular, roundish body, of a dark red colour on the outside, and a deep bright red

within. It consists of an insect which derives its nourishment from the leaves of the *cactus coccinellifer*, or, as it is differently called, *nopal*, or *nopelleca*. This plant is found most abundantly in Mexico, and other parts of New Spain; and from its leaves cochineal insects are collected, and killed either by being immersed in hot water, or put into an oven moderately heated, or more advantageously, by being exposed to the scorching rays of the sun. These singular insects in their successive generations, are taken by the Mexicans three times in a year, carefully preserving over the winter in their houses such as may be necessary for breeders, while attached to the succulent leaves of the plant. No less than 800,000 pounds, each pound containing at least 70,000 insects, are imported annually into Europe, as a highly valuable colouring drug. They are principally consumed by the scarlet dyers, and for the purpose of making carmine. The best sort has been sold for one guinea the pound. It is remarkable that the dried insect may be kept unimpaired for an indefinite length of time.

The true cochineal has been found in South Carolina, and Mr. K. Peal of Philadelphia asserts, that he has discovered it upon the island of Little St. Simons, on the coast of Georgia. It is extremely desirable that the insect, and the cactus coccinellifer plant on which it breeds, should be cultivated in the southern states. The planter might find it a valuable source of revenue, when, from vicissitudes in the season, their crops of rice or cotton should fail.

Cochineal is not employed in medicine, except for the purpose of imparting a beautiful red colour to some tinctures. Their colour is easily extracted, both by alcohol and water.

"*Cochineal* flourishes on the native nopal, or prickly pear of South Carolina. The insect thrives well, and increases and spreads on every leaf rapidly.

"The breeding of the cochineal is, however, attended with precarious circumstances; the insect is exposed to a variety of dangers from the violence of the winds, the rains, fogs, frosts, and other causes, and also from the depredations of birds, who are very fond of these insects."

Rees's Cyclo.

Cochineal has been lately recommended as an anodyne and antispasmodick in hooping cough.

Cocos Butyracea. *The Mackaw Tree. Palm Tree.* The fixed oil of the nut, commonly called Palm Oil.

This oil is obtained from the kernel of the fruit of the palm tree; which is imported from the West Indies, whither the tree has been transplanted from Africa. It is of an orange colour, and of the consistence of ointment, emitting a strong agreeable odour, but having very little taste; both of which it entirely loses by long keeping, when it becomes unfit for use. It is chiefly employed externally, for mitigating pains, cramps, and similar affections: it is likewise used for the cure of chilblains, and, if early applied, has often proved successful. With camphor, palm oil makes a common, and very excellent liniment of the stimulating kind. Muriated ammonia, (sal ammoniack) in very fine powder, rubbed with camphorated palm oil, forms one of the most active and valuable liniments, as a discutient to indolent tumours, rigidity of the tendons, &c.

Cochlearia Armoracia. *Horse Radish.* The leaves and root.

An indigenous perennial plant, growing on the sides of ditches, the banks of rivers, and other damp places, flowering in the month of May. For medicinal and culinary uses, it is also cultivated in gardens. Horse radish root has a quick pungent smell, and a penetrating acrid taste; it nevertheless contains in certain vessels a sweet juice which sometimes exudes upon the surface. By drying, it loses its acrimony; but if kept in a cool place, covered with sand, it retains its qualities for a considerable time.

The medicinal effects of this root are to stimulate the solids, and promote the fluid secretions; it seems to extend its action through the whole habit, and affect the minutest glands. It is greatly recommended by Sydenham in dropsies, particularly such as succeed intermittent fevers. In paralytick complaints horse radish has sometimes been applied with advantage as a stimulating remedy to the parts affected. When steeped in vinegar during a fortnight, this root is said effectually to remove freckles in the face. A syrup made by boiling scraped horse radish in brown sugar, is an excellent remedy in the decline of colds and of pleurisies, to promote expectoration, and remove hoarseness.

Cochlearia Officinalis. *Garden Scurvy Grass.* The plant.

This is an annual plant growing on the sea shore, and in mountainous situations, and is sometimes cultivated in gardens. It possesses a considerable degree of acrimony, and by distillation it affords an essential oil, the smell of which is so strong as to make the eyes water.

The fresh plant is a gentle stimulant and diuretick, and is chiefly used for the cure of the sea scurvy. It is employed externally as a gargle in sore throat, and scorbutick affections of the gums and mouth. It may be eaten in substance to any quantity, or the juice may be expressed from it, or it may be infused in wine or water, or its virtues may be extracted by distillation. Dr. Withering says it is a powerful remedy in the pituitous asthma, and in what Sydenham calls the scorbutick rheumatism. The juice is prescribed along with that of oranges, by the name of antiscorbutick juice.

Coffea Arabica. *The Coffee Tree.* The fruit.

A shrub from twelve to eighteen feet high, originally a native of Arabia, but is now cultivated in the East and West Indies, and in several parts of America. The Arabian, or Mocha coffee, imported from the Levant, is far the most aromatick and resinous, and, on account of its superiour flavour, is the most esteemed. Very various have been the opinions entertained by different physicians relative to the medicinal qualities of the coffee-berry; some inveighing against its use as a pernicious indulgence, others, on the contrary, are as vehement in its praise. It has been suspected of producing palsies; and Dr. Percival assures us, from his own observations, that the suspicion is not, altogether, without foundation. According, however, to the experiments, and, in the language of the same respectable author, coffee is slightly astringent and antiseptick; it moderates alimentary fermentation, and is powerfully sedative. Its medicinal qualities seem to be derived from the grateful sensation it produces on the stomach, and from the sedative powers its exerts on the *vis vitæ*. Hence it assists digestion, and relieves the headache; but in delicate habits it often occasions watchfulness, tremours, and many of those complaints denominated nervous.

The celebrated sir John Pringle, bestows high encomiums on coffee, as a remedy in paroxysms of the periodick asthma. He directs the best Mocha coffee, newly burnt, and made very strong immediately after grinding it, an ounce to one dish, without milk or sugar, to be repeated after the interval of a quarter or half an hour, until relief be obtained. We are assured also, that sir John Floyer, during the latter year of his life, kept free from, or lived easy under this afflictive complaint, by the use of strong coffee.

With respect to the medicinal properties of coffee, says Dr. Willich, it is in general excitant and stimulating, though we doubt whether it relaxes the animal fibres, as has by some authors been supposed. Its more or less wholesome effect greatly depends on the climate, as well as the age, constitution, and other peculiarities of the individual. Hence it cannot be recommended to children, or persons of a hot, cholerick, nervous, or phthisical habit; nor will it be so useful in warm, as in cold and temperate climates; but to the phlegmatick and sedentary, a cup of coffee, one or two hours after a meal, or, which is still better, one hour before it, may be of service to promote digestion, and prevent or remove a propensity to sleep. In cases of spasmodick asthma, hypochondriasis, scrofula, diarrhœa, agues, and particularly against narcotick poisons, such as opium, hemlock, &c. coffee often produces the best effects; nor is there a *domestick* remedy, better adapted to relieve periodical headaches which proceed from want of tone, or from debility of the stomach.

The heaviness, headache, giddiness, sickness, and nervous affections, which attack some persons in the morning, after taking an opiate at night, are abated by a cup or two of strong coffee.

Colchicum Autumnale. *Meadow Saffron.* The root.

This plant grows wild in rich and moist meadows in England, but has not been discovered in the United States. It is cultivated in the Elgin Botanick Garden, at New York. The root is bulbous; when recent, it is extremely acrid, a small quantity occasioning a sense of burning heat in the stomach, strangury, and tenesmus; at other times, it is entirely void of acrimony; this difference depending on climate, age, or season. The root of this plant, prepared in the form of oxymel or syrup, was for-

merly received into the pharmacopœias as a remedy in dropsy, and supposed to be diuretick ; but from the uncertainty of its operation, it was never established in practice. One ounce of the fresh root, digested in one pint of vinegar in a close glass vessel for twenty-four hours, forms the vinegar of meadow saffron ; and the oxymel is made by adding two pounds of honey to the above. The dose when designed as a diuretick is two or three drachms, but may be gradually increased to an ounce or more. Colchicum autumnale has recently been brought into notice by Mr. Want, of England, whose numerous experiments have resulted in the full belief that it possesses the power of removing the paroxysms of gout, in a degree fully equal to the celebrated *eau medicinale ;* and he has since had abundant experience to satisfy himself of the identity of the two medicines. He directs a tincture to be made by infusing, for two or three days, a quantity of the fresh sliced root of the colchicum, in proof spirits of wine, in the proportion of four ounces of the former to eight of the latter. This tincture he employed in all his first experiments ; but as the efficacious parts of the plant are soluble in water or wine, either of these menstrua may be used ; and to produce a medicine more particularly resembling the eau medicinale in its external circumstances, it is merely necessary to use good Sherry or Lisbon. For medicinal purposes, a recent infusion of the fresh or dried root in water is equally efficacious. Mr. W. has made extensive trials with this watery infusion, and never been disappointed in its effects. He was led to employ the dried root, from observing its variable strength when fresh, in which it appears to be much influenced by the weather and season of the year. The dose of this tincture, whether it be made with water, wine, or spirit, should be the same, and should vary according to the constitution of the patient. Upon an average, we may fix two drachms, or two ordinary tea spoonfuls, as the proper quantity for an adult. Mr. W.'s experiments have been made in at least forty cases, followed by results of the most satisfactory nature, the paroxysms being always removed ; and, in several instances, no return of the disease having taken place after an interval of several months. Mr. W. is authorized by Sir Joseph Banks, and major Rennell, to publish their decided conviction that his medicine, and the eau medicinale are the same, as far as they are enabled to judge from the appearance, taste, and smell.—*Med. and Phys. Journal.*

Colchicum Seeds.

In the London Medical Repository, some account is published by Mr. Williams of the employment of the seeds of colchicum in three cases of venereal rheumatism. He administered the vinous tincture of the colchicum seeds in the dose of a fluidrachm and a half in water twice in a day, and this in repeated instances afforded relief. Mr. Williams gives a decided preference to the seeds in comparison to the root of the colchicum. He represents the effects of the latter to be uncertain, and ungovernable in some cases, and states that he has known them in one case prove fatal. He knows of no bad effects to have resulted from the use of the seeds, and considers them as suited to a far more extensive range of cases than the root. In the same publication are extracts from a work by Mr. Haden, and observations by his son to the following purport. That the colchicum is a remedy of great power in the treatment of inflammatory diseases, both acute and chronick, and therefore a substitute for bleeding in disorders which are connected with increased action of the heart and arteries. In pure inflammations, if it be given every four hours until it produce an abundant purgative effect, the pulse will become nearly natural, from being either quick and hard, or slow and full. In organick derangements of structure when occasionally attended by inflammatory symptoms the above treatment answers perfectly in curing the superinduced inflammation. In chronick rheumatism six grains with one drachm of sulphate of potash taken every morning will always answer the purpose. Although in some cases many weeks elapse before a cure is effected, yet if the patient persevere it will not fail. It has great influence in consumptions, but it does not remove the complaint. After accidents, its effects are sometimes extraordinary if immediately given. In acute cases from two to eight grains of the powder with a scruple or more of sulphate of potash in rose mixture every four or six hours, increasing the dose after a few hours until either purging is produced on the second or third day, or the common black dose, or calomel is given in addition. In chronick cases one considerable dose of five grains or upwards is given every morning early with a drachm of sulphate of potash in a tumbler nearly full of warm water. In this form it is continued for weeks to-

gether, other opening medicines, such as jalap, being added to it, as occasion may require. In some cases, indeed, no relief occurs, even on the third day, when full doses of opening medicine are required, or it is necessary to increase the dose of colchicum; but in others the medicine purges on the second day without producing a corresponding relief of the symptoms; or the case is such as to make much purging unadviseable; in these cases a smaller quantity of the sal polychrest is given with the colchicum, or the latter alone without admixture. In children and weakly subjects the dose of the powder in all cases varies from sixteen grains to two scruples; so as to give from two to five or six grains of the colchicum, the full drachm containing about seven grains. It is necessary however to be cautious in taking these doses of the powder as a general rule. As little even as three grains every six hours will be sufficient to overcome common feverish attacks especially in persons of but moderate powers. Another paper in the London Medical Repository contains a statement by Mr. Rice, of cases of acute diseases treated by the colchicum autumnale, viz. acute rheumatism cured by one dose of the tincture of colchicum. The dose was a drachm and a half given in an infusion of senna and salts. In a case of puerpural fever, and another of erysipelatous inflammation the colchicum was given in combination with other active articles and proved to be a very useful auxiliary. Mr. Rice prescribed it in form of powders, five grains of the colchicum with five of jalap; and in the form of bolus, five grains of colchicum and five of calomel; also in powders, containing each three grains of colchicum and twenty of sulphate of potash.

Colomba. *Colomba.* The root.

Of the plant which furnishes this root, no botanical account has been obtained. It is brought from the town of Colombo, in the island of Ceylon, in round pieces; the sides covered with a bark; the woody part of a bright yellow colour. It has an aromatick smell, and a bitter taste. It yields its bitterness to water, but proof spirit is its proper menstruum. The Colomba-root is a powerful antiseptick and bitter; it is used with much advantage in affections of the stomach and intestinal canal, accompanied with redundance of bile; it is also employed suc-

cessfully in dyspepsia. Nor is it attended with any heating effect, and it may therefore be advantageously taken in pulmonary consumption and other hectical cases, both with a view to correct acrimony and strengthen the digestive organs. Its dose is half a drachm of the powder, which in urgent cases may be repeated every third or fourth hour. The use of this valuable drug has been particularly recommended to the attention of practitioners, by Dr. Percival, of Manchester, in his experimental essays; and it has been found to answer expectation; but it is to be regretted that it is not so regularly imported as to admit of our shops being supplied with it of good quality, it being frequently found either in a decayed or adulterated state. It has been discovered in the vicinity of the Ohio river in large quantities, and is said to be of an excellent quality. (See Frasera Carolinensis.)

Conium Maculatum. *Hemlock. Cicuta.* The leaves and seeds.

This is a large biennial umbelliferous plant, which grows very commonly about the sides of fields and hedges, and in moist shady places. The root is white, long, of the thickness of the finger, contains when it is young a milky juice, and resembles both in size and form, the carrot. In the spring it is very poisonous, in harvest less so. The stalk is three, four, and often six feet high, hollow, smooth, and marked with red or brown spots. The leaves are large, and of a dark green colour, having a faint disagreeable smell, resembling the urine of a cat. The seeds are inferiour in strength. The whole plant is a virulent poison, but varying very much in strength according to circumstances. When taken in an over dose, it produces vertigo, dimness of sight, difficulty of speech, nausea, putrid eructations, anxiety, tremours, and paralysis of the limbs: to which may be added, dilation of the pupils, delirium, stupor, and convulsions. But the internal use of this narcotick medicine was introduced by Dr. Stork, who found that in small doses, it might be given with safety. He recommended it particularly in scirrhus and in cancerous sores, in which it received a very extensive trial. While its inefficacy towards effecting a radical cure is established, its utility as a palliative medicine is generally admitted. It has likewise been found serviceable in scrofulous and

venereal ulcerations, cutaneous affections, glandular tumours, chronick rheumatism, and various other diseases. In open cancer it often abates the pains, and is free from the constipating effects of opium. The dose is two or three grains of the powdered leaves, or one or two grains of the inspissated juice. It requires to be increased, in general, to a very considerable extent: at the same time, this must be done with caution, as both the dried leaves and inspissated juice are variable in their strength. In some cases the former have been increased to upwards of two ounces a day without producing giddiness. Dr. L. Valentine has furnished the publick with a remarkable case at St. Domingo, of an inveterate disease of the bladder, attended by tetters and erysipelas, in which he prescribed the latter from six or eight grains to a drachm, and afterwards to three drachms per day. At the end of one year his patient had taken the quantity of four pounds; by which a radical cure was effected.* In this and in other well attested instances, salivation was induced by the use of hemlock.

In scirrhus and other affections of the liver, and in difficult and painful menstruation, cicuta has been employed with much advantage. In that distressing disease termed tic doloureux, or neuralgia, cicuta has been found a remedy of great importance. It seldom fails to palliate the painful paroxysms, and in some instances it has effected radical cures. In its exhibition the dose is to be gradually increased from one grain of the inspissated juice, or extract, to the full extent which the particular constitution can bear, or circumstances require. As the effect of the medicine becomes evident within two hours, and often within fifteen or twenty minutes after being received into the stomach, the second or third dose may be increased to five grains, and adding five grains to every future dose, progressively every second hour, or at longer or shorter intervals according to the urgency of the case, till its effects on the system are evinced by the occurrence of slight dizziness, nausea, or some other sensation. In one recent instance three hundred grains were given in six hours, and in another four hundred grains in seven hours, by which dizziness and faintings, with inability to set up, were induced, but a very essential respite from

* Med. Repository.

pain was the happy result.* When the extract of cicuta appears of doubtful quality, the tincture of the same plant prepared in the same proportions as the tincture of digitalis, may be substituted, beginning with thirty drops, and increasing in the same manner as the extract. As no medicine is more variable and uncertain in its strength than the extract of cicuta, every prescriber should be particularly attentive to the preparation which he employs. That which comes from Europe is of little strength, and seldom to be relied on.

The extract should be renewed from the fresh plant every year. The leaves collected for the purpose must be at full maturity while in flower, and the decoction should be evaporated by means of boiling salt water.

The dried leaves are less liable to injury from keeping, than the inspissated juice. The leaves should be collected in the month of June or July, when the plant is in flower, and its peculiar smell strong. The drying of the leaves should be performed quickly before a fire on tin plates, and the powder should be kept in phials closely stopped and secluded from the light, for this soon dissipates the green colour, and with it the virtues of the medicine. The proof of the drying having been well performed is the powder's retaining the odour of the leaves, and the deepness and freshness of the colour. Dr. Joshua Fisher, a highly respectable and intelligible physician of Beverly, has experienced the beneficial effects of cicuta in a variety of cases of scrofulous affections of the abdominal viscera, and in phthisis pulmonalis. But in the hands of this accurate observer, cicuta has been found remarkably successful as a remedy in jaundice occasioned by spasmodick contraction of the biliary ducts. He adduces a variety of instances in which the antispasmodick powers of this medicine were happily demonstrated, and cures completely effected.

Drs. Jackson and Bigelow, medical professors in our university, have added their testimony in favour of the great utility of this remedy in the cure of jaundice. When the dose is gradually increased until its effects are distinctly felt in the head and stomach, the yellowness of the skin and eyes in most cases begins to disappear by the second day, and the disease is soon removed.

* See Amer. Modern Practice, page 468, 469.

CONVOLVULUS SCAMMONIA. *Scammony.* The gum-resin.

This is a concrete gummy-resinous juice obtained from the roots of the *convolvulus scammonia*, or Syrian bind weed, an exotick plant growing in Asiatick Turkey. The best scammony is imported from Aleppo, in light, spongy, friable masses, of a shining blackish ash colour. It possesses a faint unpleasant smell, and a bitterish pungent taste. It consists of resin and gum, in general nearly in equal proportions. In its medicinal effects, scammony is an efficacious but violent purgative, employed chiefly in obstinate constipation. If triturated with sugar, almonds, or gum arabick, it becomes sufficiently mild, and safe in its operation. It may also be dissolved in a strong decoction of liquorice, in which form it is not disagreeable to the palate, and proves a gentle laxative. The common dose is from three to twelve grains. The true scammony plant has lately, it is said, been found in Sussex county, New Jersey; but with what prospect of its being productive, is not ascertained.

CONVOLVULUS JALAPA. *Jalap.* The root.

The dried root of jalap is imported from New Spain in thin transverse slices; solid and heavy, of a dark gray colour, and striated texture. It has little smell, its taste is bitter and subacrid. The medicinal activity of jalap resides principally if not wholly in the resin, which, though given in small doses, occasions violent griping. The gummy part bears an inconsiderable proportion to the resinous, and is found to have little or no cathartick power; but as a diuretick it is extremely active. That jalap is an efficacious and safe purgative, daily experience must evince; and, except when given in very large doses, it is not heating to the system. If triturated with hard sugar it becomes in moderate doses a safe medicine for children, which in this form they will readily receive, as the jalap itself has very little taste. Jalap in large doses, or when combined with mild muriate of mercury (calomel,) is recommended as an anthelmintick and a hydragogue. The dose of the simple powder is commonly from one scruple to two, but its efficacy is considerably increased by the addition of crystals of tartar. Dr. Rush's celebrated purgative in yellow fever, consists of ten grains of jalap and

ten of calomel, but double the quantity of the former has been found to be a more suitable proportion. Dr. Aiken asserts that fifteen grains of jalap with two or three of ipecacuanha purge more than twice the quantity of jalap by itself.

Convolvulus Panduratus. *Wild Potato.* The root.

This is supposed by professor Barton, to be the mechameck, or wild rhubarb of some of our Indians. In the state of Delaware it is called wild-potato vine; and the root kussander or kassader, (a corruption of the word cassada.) From one of our species of convolvulus, an extract has been procured, but little if any inferiour to the scammony of the shops. In Virginia, and some other parts of the United States, the root of this plant has been much recommended in cases of gravel. It is used either in powder or in decoction. Dr. Harris, of New Jersey, has found an infusion, or decoction of the root, very useful in his own case. He is persuaded, that it has enabled him to pass the calculi renales with much facility.

Copaifera Officinalis. *Copaiva Tree.* The liquid resin, called balsam of copaiva.

The tree which produces the balsam copaiva is a native of the Spanish West Indies, and of some part of the continent of South America. It grows to a large size, and the resinous juice flows in considerable quantities from incisions made in the trunk. It is thick and tenacious, with a yellowish tinge, has a peculiar not disagreeable smell, and a pungent bitter taste. It is soluble in alcohol and in expressed and essential oils. Distilled with water it affords nearly half its weight of an essential oil, an insipid resin being the residuum.

Balsam of copaiva increases the urinary discharge, and communicates to the urine a violet odour. In too large a dose, it excites inflammation of the urinary passages. From its power of stimulating these parts, it frequently proves successful in the cure of gleet. It has also been given in leucorrhœa and in hæmorrhoidal affections with advantage. It is a useful corroborating detergent medicine. It strengthens the nervous system, tends to loosen the bowels; and in large doses proves purgative, promotes urine, and cleanses and heals exulcerations in the urinary passages, which it is supposed to perform more

effectually than any of the other resinous fluids. It has also been recommended in dysenteries, and in diseases of the breast and lungs. Very dangerous coughs have been cured by the use of this balsam alone. In catarrhal affections to which old people are liable, it is a useful medicine. The dose should not exceed forty or fifty drops twice or thrice a day. A convenient way to take it is, to mix it up in brown sugar, drinking a glass of water after each dose, or it may be diffused in water by the medium of a mucilage of gum arabick.

"It is now upwards of ten years," says professor Chapman, "since I have trusted exclusively to the balsam copaiva in the cure of gonorrhœa, and my confidence in its powers is fully established. Contrasted with the ordinary mode of treating the disease by injections, this plan has a decided superiority. It is more convenient to the patient. It produces no swelled testicle. It occasions no strictures. It leaves no gleet. It is more prompt and certain in the cure. I prescribe the medicine at the very commencement of the attack, utterly regardless of all the appearances of inflammation, and exhibit it freely. Nothing more speedily abates the ardor urinæ, chordee, and other troublesome affections. It will sometimes be useful to combine with the copaiva the dulcified spirit of nitre, and a considerable portion of laudanum. If judiciously administered, the copaiva will commonly effect a cure in three or four days, and sometimes in a much shorter period. I have known it often to put an end to the disease in less than twenty-four hours. But to attain this free and prompt operation of the medicine, the patient must honestly abstain from every stimulating article of diet or drink, and impose upon himself a complete state of rest. I have also found the copaiva very serviceable in relieving the strangury from blisters." (Murray's Mat. Med. by Chapman.)

Care should be taken that the balsam be pure, neither adulterated nor injured by age. The following is a convenient formula, and well adapted in some cases of phthisis pulmonalis.

℞ Bal. copaiva, ℥ss.
Spt. lavend. comp. spt. nit. dul. aa ℥ii.
Laudanum ℥i.
Gum arab. ℥ii.
Water ℥4. m.
Dose, a table spoonful, morning, noon, and night.

Coptis Trifolia. *Gold Thread.* The root.

This article has by botanists been ranked with the hellebores, but professor Bigelow in his medical botany has adopted from Mr. Salisbury the generick name of *coptis.* It is a small delicate plant found in wet swampy situations. The stems are erect and naked. The leaves grow by threes at the termination of the stems, and are evergreen, roundish and lobed. The white solitary blossoms appear in May. The roots appear singular, creeping extensively under moss and decayed leaves; they are thread shaped and of a bright yellow colour, from which the name of gold thread is taken. The root has long been a popular remedy as a local application in aphthous and cankerous sores in the mouths of children, but Dr. Bigelow has ascertained by examination that it is entirely destitute of astringent or stimulating qualities, by which it can act on the ulcerated spots with efficacy. As a pure tonick bitter, he observes, capable of strengthening the viscera and promoting digestion, it is entitled to rank with most articles of that kind now in use. Its character resembles that of gentian, quassia, and columbo, being a simple bitter, without aroma or astringency. The tincture made by digesting half an ounce of the bruised root in eight ounces of diluted alcohol, forms a preparation of a fine yellow colour, possessing the whole bitterness of the plant. This Dr. Bigelow has given in various instances to dyspepticks and convalescents, who have generally expressed satisfaction from its effects, at least, as frequently as from other medicines of its class. A teaspoon full may be taken three times a day. In substance, it rests well on the stomach, in doses of ten or twenty grains.

Coriandrum Sativum. *Coriander.* The seeds.

The seeds of coriander have commonly been imported from the south of Europe; but the plant is frequently cultivated in our own gardens, and may be produced to any extent. It is an annual umbelliferous plant, and the seeds differ from all the others of that class in being spherical. These possess a pleasant flavour; and when encrusted with sugar are sold by the confectioners under the name of *coriander comfits.* Their taste is moderately warm. Like caraway, they are used as carminative, and likewise to cover the taste and flavour of some medicines,

particularly senna, when given under the form of infusion or tincture.

CORNUS FLORIDA. *Common Dogwood. Boxwood.* The fruit and bark.

This is one of our most beautiful and useful shrubs, growing in almost every part of the United States. In New England it is well known by the name of boxwood. It flowers very early in the spring, and with so much regularity that some of our southern tribes were accustomed to name the spring season from its flowering. The flowers generally make their appearance about the beginning of May, in the middle states, and exhibit a most beautiful appearance. The large white flowers form a fine contrast with the green of the forest, and are the ornament of our woods. These are succeeded by oblong drupes or berries of a rich glossy crimson colour which ripen in September. They have a very bitter taste, and an infusion of them in rum or brandy is much esteemed as an agreeable morning bitter. The bark both of the stem and root, is considerably astringent, and has long been employed in intermittent fevers. And as possessing properties closely allied to the Peruvian bark, this and the following article will be found excellent substitutes.

Cornus Sericea, or American red-rod cornel. Called also red willow ; swamp dogwood ; blue berried dogwood. This agrees in its generick character with the cornus florida. It grows in a moist soil by the sides of creeks and rivers, and in swamps, seldom attaining in height more than six or eight feet. In general a considerable number of stems arise from the same root, and are very straight. The bark of the young shoots is very smooth, shining, and of a rich dark red colour. The branches are placed opposite, as are also the leaves, which a good deal resemble the cornus florida. The flowers are produced in clusters or cymes at the extremity of every branch, and give to this shrub a very elegant appearance, being of a whitish colour in June and July. They are succeeded by succulent drupes or berries, which are of a blue colour, inclining to green when ripe.

Both these American species of cornel are found by experiments instituted by Dr. John M. Walker to possess the same ingredients with cinchona. The bark of cornus sericea forms a beautiful tincture with proof spirit,

which has been useful in the latter stages of diarrhœa unaccompanied with fever. This and the powdered bark of both species are well deserving a place in the apothecaries' shops, as valuable additions to our materia medica. It is asserted by Dr. Walker that in whatever form of disease the cinchona has been decidedly serviceable, the corni will be found equally so. They are like cinchona bark, bitter and astringent in the month, tonick and febrifuge in the stomach; and their chemical analysis affords results perfectly analogous. Thirty-five grains of powdered bark of dogwood is considered equal to thirty of cinchona. Professor Barton adds his decided testimony relative to the efficacy of dogwood as a valuable substitute for the Peruvian bark in the cure of intermittent fevers.

This article as a remedy has attracted the attention of medical practitioners of the United States, many of whom have vouched for their tonick and astringent powers, as being little if any inferiour to those of cinchona officinalis. If therefore our native productions are adequate to our exigencies, let expensive exoticks be rejected.

Crocus Sativus. *Common Saffron.* The summit of the pistils, called saffron.

Saffron is a bulbous rooted perennial plant, very generally cultivated in gardens in European countries. The smell of saffron is pleasant and aromatick, but narcotick; the taste a fine aromatick bitter, and it immediately gives a deep yellow colour to the saliva, when chewed.

The active matter is equally extracted by alcohol, water, proof spirit, and vinegar. Saffron is remarkably fragrant, and is highly esteemed, as it exhilarates the spirits when taken in small doses; but, if used in too large portions, it produces immoderate mirth, and all the consequences resulting from the abuse of spirituous liquors. This drug was formerly considered an excellent remedy in hysterick depressions originating from spasms, or in obstruction of the uterine secretions; but in modern practice it is seldom employed, though it enters into several medicinal preparations. The best saffron is that raised in England: it ought to be of a deep red or orange colour, fresh and tough, though neither too dry nor too moist, and of a strong but pleasant aromatick odour. The common saffron of our gardens, if properly prepared by moisten-

ing with brandy and pressing into cakes, will be found a tolerable substitute for the imported drug.

Croton Eleutheria. *Cascarilla.* The bark.

This bark is imported from the Bahama Islands, particularly from one of them of the name of Elutheria, whence its title is derived. But Dr. Wright also found the tree on the sea shore in Jamaica, where it is common, and rises to about twenty feet. It is imported in the form of curled pieces, or rolled up into short quills about an inch in width, externally resembling the Peruvian bark. Divested of its whitish upper rind, the cascarilla possesses an agreeable smell, and a bitterish, pungent aromatick taste. This inflammable drug, when burning, emits a fragrant odour, not unlike that of musk.

The cascarilla is frequently and successfully administered in intermittent fevers, even as a substitute for the *cinchona;* being less liable to produce the inconveniences which the latter is apt to occasion by its astringency. Cascarilla, according to medical writers, has also been employed with uncommon advantage in dangerous epidemick and *petechial* fevers, in flatulent colicks, internal hæmorrhages, dysenteries, and diarrhœas. The virtues of cascarilla are partially extracted by water, and totally by rectified spirit, though it is more efficacious given in powder from ten to thirty grains every four, six, or eight hours.

Cubeba. *Cubebs.* The fruit.

This is an East India fruit having a great resemblance to pepper. The principal difference distinguishable by the eye, is that each cubeb is furnished with a long slender stalk. In aromatick warmth and pungency, cubebs are far inferiour to pepper. They were formerly considered medicinal, but are little known in modern practice. They have now a place in the materia medica of our national pharmacopœia. It has been found by recent experience that cubebs are of great utility as a remedy in gonorrhœa. In the Edinburgh Medical Journal it is stated that Mr. Adams has experienced the efficacy of this remedy in numerous instances, and he is disposed to consider it as a specifick in the early stage of gonorrhœa. When exhibited before inflammation has come on and being conjoined with the usual injection of sulphate of zinc, it has

rarely been found to fail in removing the affection within two or three days. The manner of preparing the powder of cubeba is extremely simple. All that is necessary is to put it into some aqueous vehicle. The dose is a drachm and a half repeated three or four times a day. In small doses it is useless. The effects of the cubeba are very prompt. Pain is at once relieved, and in the first discharge of urine after its use the smell of the article is very evident. It frequently produces unpleasant sense of heat in the palm of the hands and soles of the feet; it often irritates the bowels and produces diarrhœa. These effects however, are entirely alleviated by the addition of small quantity of opium to the cubeba.

Cucumis Colocynthis. *Colocynth. Bitter apple.* The pulp of the fruit.

This article is the produce of Syria and the island of Crete. The fruit is yellow, of the size of an orange, and resembles a gourd, the shell of which contains a very light, white pulp, interspersed with flattish seeds. It is this spongy or medullary part of the fruit, when dried, that is used in medicine. Its taste is intensely bitter. Boiled in water it gives out a large portion of mucilage, less active than the colocynth itself. Alcohol also dissolves only part of its active matter.

Colocynth is one of the most drastick purgatives, so much so that its operation is not easily regulated. Its dose is from three to six grains, but it is seldom that it is given by itself, being rather used to promote the operation of other catharticks. Combinations of it with jalap, aloes, or mild muriate of mercury, are thus given in obstinate constipation, in mania and coma; and in these combinations it operates more mildly and more effectually than if given alone. Its infusion has been recommended as an anthelmintick. But as we are possessed of numerous native plants of similar and much milder virtues, there appears to be no necessity for employing this exotick.

Cuprum. *Copper.*

This has a more perceptible smell and taste than any other metal. Its effects, when taken into the stomach, are highly deleterious, and often fatal. It particularly affects the primæ viæ, exciting excessive nausea, vomiting,

colick pains, and purging, sometimes of blood, or, though more rarely, obstinate constipation. It also produces agitation of the mind, headache, vertigo, delirium; renders the pulse small and weak, the countenance pale, and causes fainting, convulsions, paralysis, and apoplexy. When any of these symptoms occur, we must endeavour to obviate the action of the poison by large and copious draughts of oily and mucilaginous liquors; or to destroy its virulence by solutions of potash, or sulphuret of potash.

Great care ought to be taken that acid liquors, or even water, designed for internal use, be not suffered to stand long in vessels made of copper; otherwise they will dissolve so much of it, as will give them very dangerous properties. But although copper be thus dangerous, some preparations of it are, in certain cases, used with great advantage, both internally and externally. Its tonick power, like that of zinc, is estimated by its successful exhibition in epilepsy, and some other spasmodick diseases, depending on, or connected with debility.

According to Dr. W. Saunders, copper is of all the metals the most astringent and most soluble in the stomach; but on account of the uncertainty of acid in the stomach the dose is difficultly ascertained, and it is rarely used. Preparations of copper, however, when the intention is to lessen irritability, are extremely useful, particularly in hysterical cases attended with plethora, and in epileptick spasms. Copper is the basis also of a quack remedy for the prevention and cure of hydrophobia, and in this view it is probably deserving of attention.

Curcuma Longa. *Turmerick.* The root.

Turmerick is a perennial plant, a native of India. The roots are tuberous, knotty, long and wrinkled; externally of a pale yellow colour, internally of a shining saffron brown. They have a weak aromatick smell, and a slightly bitter aromatick taste. Turmerick, taken internally, tinges the urine of a deep yellow colour, and acts as a gentle stimulant. It has been celebrated in diseases of the liver, jaundice, cachexy, dropsy, intermittent fevers, &c. Its internal use is now generally dispensed with; and it is only esteemed as affording a valuable yellow dye. Turmerick is a production of the United States, being found on the borders of the Ohio river.

DAPHNE MEZEREUM. *Mezereon. Spurge Laurel.* The bark of the root.

An indigenous low shrub, growing in woods and shady places, and flowering in the month of February or March. When cultivated in gardens, it attains in a rich soil, the height of sixteen feet. It has no cup but a funnel-shaped corolla of one petal enclosing the stamins, and the border cut into four segments. The fruit is a berry, in which is found a single seed. The leaves are spear-shaped, and the flowers grow by threes from the same joint sitting upon the stem, and are of a beautiful red or rose colour. The whole of this plant is so corrosive, that six of its berries are said to kill a wolf. The bark of the root of this plant, is the part used in medicine; its taste, when chewed for some time, is extremely acrid, exciting an insupportable sensation of burning in the mouth and throat. Its acrimony is somewhat impaired by drying. It is extracted by water and vinegar. Mezereon is a stimulating diaphoretick, which, by determining to the surface, has been found of service in chronick rheumatism, and in cutaneous diseases. Its principal use has been in syphilis, as being particularly efficacious in removing venereal nodes, and thickening of the ligaments and periosteum, and disposing ulcerations to heal. It is given in the form of decoction; two drachms of the bark, with half an ounce of liquorice root, being boiled in three pounds of water, to two pounds, and four or six ounces of this given four times in a day. It is generally combined with sarsaparilla: such a combination, forms the *decotum sarsaparillæ compositum*, an improved formula for the Lisbon diet drink. Dr. Withering has found this bark serviceable in removing a difficulty of swallowing, and asserts, that a patient who lived under extreme difficulty of swallowing for three years, was effectually cured in two months, by chewing the root of mezereon as often as she could support its irritating effects. This bark, when applied to the skin in its recent state, or infused in vinegar, is effectual in raising a blister, and is sometimes employed for the purpose of keeping up a perpetual discharge, for the removal of some chronick local affections. From the ripe berries of this plant, an excellent red lake is prepared by painters. Mezereon grows plentifully in the vicinity of the Ohio river.

DATURA STRAMONIUM. *Thorn Apple. Apple Peru.* The leaves and seeds.

The thorn apple is an annual plant, and grows very abundantly in almost every section of the country, delighting in a rich soil, on dunghills, or other fertile spots. In the southern states it has been known by the name of Jamestown weed, or stink weed. It is said not frequently to be produced at a distance from the sea coast. There are two varieties of this plant, frequently found growing near each other, and flowering in August and September. Of one variety the stem is of a pale green, often solid, and the flowers clear white. The other is considerably larger in size, has a uniformly hollow stem, of a purple colour, covered with light dots; the flowers light purple, or blue, striped on the inside. In both varieties the stem is erect, repeatedly forked, with spreading branches, and from two to four feet in height. The fruit is of the size of a small hen's egg, covered with thorns. The leaves are egg-shaped, pointed, angular, and deeply indented; of a disagreeable smell, and nauseous taste. It is the purple sort that is chiefly employed in medicine, though it is said the sensible qualities of the two varieties are the same. Every part of this plant is a strong narcotick poison; and instances frequently occur of children and others having suffered the most alarming consequences, and sometimes even death, from swallowing the seeds or leaves. The symptoms, immediately after being received into the stomach, are dilatation of the pupils, vertigo, delirium, tremour, itching, eruption, insupportable thirst, and palsy, which soon terminate in death. A medical gentleman was called to a family, eight of whom were suffering the noxious effects of stramonium, the leaves of which had been eaten at table, mixed with other vegetables. They exhibited a scene scarcely to be described, and formed a group in which were manifested the symptoms designating the various grades from idiotism to mania; such as torpor, or abolition of sense, slow pulse, vertigo, tremour, wild delirium, and raving, with glaring eyes, and dilated pupil. They all recovered in about twenty-four hours, by the use of strong emeticks. The most effectual antidotes to the poison of stramonium are a speedy emetick followed by a free use of the vegetable acids and strong coffee. Baron Stork, of Vienna, was the first who introduced stramonium into the practice of medicine, and he em-

ployed it extensively as a remedy in mania, epilepsy, and in spasmodick and convulsive affections in general. The reputation which this plant had acquired in the hands of the baron, was considerably diminished, until revived by American physicians, who have obtained a very extensive knowledge of its valuable properties. The late professor Barton esteemed it as a good stimulant and diuretick, and as a medicine possessing great and invaluable powers. He has frequently exhibited it with success in cases of mania and epilepsy. The extract prepared from the fresh leaves is the form in which he prescribed it, beginning with a few grains, and increasing gradually to the extent of fifteen or twenty grains. In one case of mania, Dr. Barton gave to the extent of sixty grains at one dose. In another instance, in which it was exhibited to fifty grains daily, divided into two doses, it obviated a recurrence of epileptick fits, but produced dilated pupils, blindness, and sleepiness. Dr. J. Fisher, President of the Massachusetts Medical Society, extols it as a valuable remedy in epilepsy in young persons, where the fits occur daily or monthly, at regular periods, especially if assisted by chalybeates, or such other medicines as particular symptoms appear to require. He observes, that the patient must be kept constantly under the influence of the medicine; for this purpose, he will require every day one or two doses, according to the severity of the symptoms. The saturated tincture, he says, is the most convenient form for children. The requisite dose may be ascertained by the dilatation of the pupils. The stramonium having displayed its efficacy under the prescription of numerous physicians, its character seems to be in a manner established, and the use of it is extended to a variety of diseases. Though its failure is not unfrequently to be expected, its efficacy has often surpassed that of other remedies of the antispasmodick class. A lady, aged about fifty-five years, having for some months been afflicted with alarming attacks of epilepsy, by which her powers of intellect and of articulation were impaired, happily experienced a restoration, by taking one grain of the extract, once or twice in twenty-four hours. Although she did not suffer another attack after commencing the course, she found it necessary to continue it during several months, to remove all apprehension of a recurrence. A single grain seldom failed to excite unpleasant vertiginous sensations, accompanied with an efflorescence about her face, and some

degree of sleepiness. Stramonium has been advantageously employed in chorea and tetanus, and is said to have proved beneficial in palsy and rheumatism; and also as an emmenagogue, especially in dysmenorrhœa, or painful menstruation. A singular case of spasmodick cough, accompanied with convulsions, subsultus tendinum, and a train of nervous symptoms, having baffled all the usual remedies, yielded in a few days to the extract of stramonium, beginning with two, and increasing to six grains.* In asthma, and in the advanced stage of pulmonary consumption, attended by cough and laborious respiration, very essential relief is obtained by smoking the dried leaves of this plant in a common tobacco pipe. In a pamphlet recently published by an English physician is stated a number of instances of successful treatment of convulsions and constipation in children by means of immersion in a decoction of the leaves of stramonium. From its narcotick and antispasmodick powers much confidence may be reposed in this mode of application. In that distressing disease, tic douloureux, stramonium has, in numerous instances, proved a valuable palliative remedy. A lady who has for several years been afflicted with neuralgia having employed cicuta belladonna, &c. to the full extent, without effect, and at length submitted to the operation of dividing the nerve, is now in the constant practice of resorting to this medicine as the only mean of relief. A single grain of the extract is her usual dose, but it never fails to produce extreme dryness of the mouth, giddiness and stupor, by combining, however, an equal quantity of Pul. Ipecacuan. these unpleasant sensations are essentially diminished. Dr. Marcet, of London, has experienced the efficacy of stramonium in relieving acute pains in chronick diseases of various kinds. In sciatica combined with syphilitick pains; cancer of the breast, and in an acute uterine disease. He found it also of great and repeated utility in a case of tic douloureux though in one instance it entirely failed. Professor Bigelow found in a case of tic douloureux of long standing the extract taken in as large doses as the stomach would bear to afford decided relief. This gentleman approves of the ointment of stramonium as a valuable anodyne sedative application. It mitigates the pain in burns and inflammatory tumours, and promotes the cure of certain

* New Eng. Journal of Med. and Surg. vol. iv. p. 226.

cutaneous eruptions. In some irritable ulcers with thickened edges and a sanious discharge he has found it remarkably efficacious in changing the condition and promoting the granulations and cicatrization. He has found in painful hemorrhoidal tumours the ointment of stramonium with the ointment of acetate of lead inferiour in its efficacy to no application with which he is acquainted. Applied topically to the eye he observes the preparations of stramonium diminish the sensibility of the retina, and relax the iris. From this effect it is employed by many surgeons to dilate the pupil as preparatory to the operation for cataract. In the language of Dr. Bigelow, (Med. Botany,) "The forms in which the stramonium is prepared for use, are the powder, the inspissated juice, the extract, the tincture, and the ointment. The *powder* should be made as soon as the plant is dry, and kept in close stopped bottles. The *inspissated juice* is made by compressing the bruised leaves in a strong bag, until the juice is forced out. This is to be evaporated in flat vessels at the heat of boiling salt water to the thickness of honey; it is then suffered to cool, put up in glazed vessels and moistened with alcohol. The *extract* is prepared by immersing a pound of the leaves in three gallons of water and boiling down to one. The decoction should then be strained and stand six hours to settle, after which it may be drawn off and evaporated to the proper consistence. When the seeds are used, the decoction should stand a longer time to separate the oil with which the cotyledons abound, before evaporation. A larger amount of extract may be obtained by boiling the portion, which has been used, a second time in a smaller quantity of water, and mixing the two decoctions before evaporation. For the *tincture* one ounce of the dried leaves is to be digested for a week in eight ounces of proof spirit, and filtrated through paper. In making the *ointment*, a pound of the fresh leaves may be simmered in three pounds of hog's lard until the leaves become crisp. It is then to be strained, and cooled gradually. The period for gathering the leaves is from the time the plant begins to flower, until the arrival of frost. As the preparations of stramonium are liable to vary in strength according to the circumstances under which they are made, it is always prudent to begin with the smallest dose, and repeat it about three times a day, increasing each dose until the effects begin to appear in

the stomach or head. The commencing doses of the stramonium, when properly prepared, are as follows:

Of the powdered leaves, 1 grain.
Powdered seeds, $\frac{1}{2}$ a grain.
Inspissated juice or extract, 1 grain.
Extract of the seeds from $\frac{1}{4}$ to $\frac{1}{2}$ a grain.
Tincture from 15 to 20 drops."

The leaves bruised, or the ointment when thoroughly applied to indurated and inflamed breasts of nursing women, have an excellent effect in abating inflammation, discussing the tumour and thereby preventing suppuration.

DAUCUS CAROTA. *Wild Carrot.* The seeds.

The seeds of wild carrot have a moderately warm pungent taste, and an agreeable aromatick smell. They are carminative, and are said to be diuretick. The roots of the cultivated variety, *common carrot*, contain much mucilaginous and saccharine matter, and are therefore highly nutricious and emollient. When beaten to a pulp, they form an excellent application to cancerous and other ill conditioned ulcers; allaying the pain, checking the suppuration and fœtid smell, and softening the callous edges. A marmalade of carrots, on account of their strong antiseptick qualities, has been successfully used for preventing and curing the sea-scurvy. An infusion of these roots has also been found to afford considerable relief to persons afflicted with the stone and worms, but especially the tape worm. It may be given to the extent of a pint in a day.

DIGITALIS PURPUREA. *The purple or common Foxglove.* The leaves.

This is a biennial plant not indigenous to the United States, but of late cultivated in our gardens. The plant rises to two feet or more, the leaves are large, oblong, egg shaped, soft, covered with hairs, and serrated. They have a bitter, very nauseous taste, with some acrimony. The flowers are in long terminating spikes. Blossoms appear in June and July, of the second year, of a beautiful purple colour, elegantly mottled in the inside with spots like little eyes. All its parts are powerfully narcotick, but the leaves being most uniform in strength, are preferred

for medicinal use. They are to be collected when the plant is in blossom, and dried before a gentle fire, the thicker stalks being removed; and they ought to be kept without being reduced to powder.

The operation of digitalis on the system is extremely peculiar, and there is even considerable difficulty is ascertaining its real effects. In a full dose, it produces exhaustion of power, marked by a great and sudden reduction in the force of the circulation; the pulse being reduced both in frequency and force, falling sometimes from seventy to forty or thirty-five beats in a minute, and being small and tremulous. This is accompanied with sickness, anxiety, vertigo, dimness of vision, and, in a large dose, with vomiting, syncope, coldness of the extremities, convulsions and coma, with sometimes a fatal termination. Yet these effects are not uniform, but even from the same dose we observe considerable diversity of operation in different individuals: thus the pulse is sometimes rendered lower without being diminished in fulness; at other times it is rendered irregular: nor does sickness always accompany the reduction of the force of the circulation. Sometimes none of these effects, and scarcely any perceptible change in the state of the functions, are immediately apparent; but if the dose be continued, they are suddenly produced. Effects are even observed, from the operation of foxglove, apparently of a very opposite kind. While it reduces the force of the circulation, it appears to increase the action of the absorbent system, and hence proves a powerful remedy in dropsy; and Dr. Withering, by whom its powers were first particularly investigated, observed, that when given in a state of disease, it was most successful, not where there existed increased action in the system, but, on the contrary, in states of debility, where the pulse was feeble and intermitting, and the countenance pale. Other authors have remarked its stimulant operation; and Dr. Sanders, from a series of observations and experiments, has inferred, that it always acts primarily as a stimulant, augmenting, when given in a dose not too large, the force and frequency of the pulse, and inducing a state of increased action; it is only when it is accumulated by repetition, or by too large a dose, that reduction of the force of the circulation and other symptoms of diminished power are produced; and hence, according to this view, it is strictly analogous in its operation to other narcoticks.

It must be admitted, however, that it is more difficult to regulate the administration of digitalis, so as to obtain its continued stimulant operation, than it is with regard to other stimulants; that there is a rapid transition to a state of diminished action, and that this is greater, and more permanent, compared with the primary stimulant effect, than in other stimulants even of the diffusible kind.

Foxglove, producing very different effects according to the mode in which it is administered, or according to the state of the system, is employed as a remedy in different diseases. On its action as a narcotick, in part at least, has been supposed to depend the advantage derived from it as a remedy in phthisis pulmonalis. When given to that extent in which it reduces the velocity and force of the circulation, it proves useful, by counteracting that state of increased action which prevails in the incipient stage of the disease; and by diminishing the rapidity of the circulation through the lungs, it may facilitate the removal of the local affection. In the more advanced stages, it may operate, it has been conceived, by promoting absorption, thus removing the tuberculous affection, or withdrawing the purulent matter, before it has been rendered acrid by the action of the air. Sanguine expectations have been formed of the advantages to be derived from it in the treatment of phthisis, many of the symptoms disappearing under its use, and the progress of the disease appearing to be arrested. The change of organick structure is, however, so considerable, at least in the advanced state of the disease, as scarcely to admit of a cure from the operation of any remedy; and the operation of foxglove is so much diversified, that perhaps the proper mode of administering it has not been precisely determined, so as to admit of all the advantage being received from it that might be derived. It is difficult, as Dr. W. Hamilton has remarked, to give it so as to reduce the force of the circulation, and continue this effect, without its inducing other consequences, which compel us to relinquish its use.

Foxglove has been proposed as a remedy in pneumonia, from its power of reducing the force of the circulation when given in a sufficient dose, conjoined with blood-letting; and cases have been related of the success attending the practice, while some authors have condemned it as hazardous, from the excitement it is liable to produce.

On a similar principle, it has been proposed to be employed in croup.

In active hæmorrhage, it might be expected, from the same operation, to be a remedy of much power; and, according to the observations of Ferriar and others, it may be employed with signal advantage in epistaxis, hæmoptysis, and menorrhagia, either alone or in combination with opium. In spasmodick asthma, the combination of it with opium has afforded much relief. In palpitation arising from intemperance, or from passions of the mind, and not connected with dyspepsia, the irregular action of the heart has been abated, and at length entirely removed by its operation.

Foxglove is given in substance, or under the form of infusion, decoction, or tincture.

The medium dose of the powder of the dried leaves is half a grain; the dose of the infusion prepared according to the formula of Withering, now received into the pharmacopœias, is half an ounce; that of the tincture is fifteen drops; these quantities being given twice a day. The decoction is an improper form, as being variable in strength. The tincture is the form of preparation under which it has usually been given as a narcotick: the infusion that in which it has been employed as a diuretick. Given in substance, there is supposed to be rather more risk of its effects accumulating from repetition of the dose, so as to induce unpleasant symptoms which arise from an over dose.

To obtain the full narcotick operation of foxglove, the dose given at first requires to be gradually increased, but this increase must be made with much caution, not only from the hazard attending an over dose, but from the circumstance that the action of the remedy is for a time not apparent; but if the dose has been too large, or repeated at intervals not sufficiently distant, it appears suddenly, and continues progressive. Hence the necessity of the practitioner's watching with the greatest attention the effects it produces. The augmentation may proceed at the rate of one fourth of the original quantity every second day, and the dose should not be repeated more than twice, or at farthest thrice a day, unless in acute diseases, where the effect must be more speedily obtained, and where, therefore, the augmentation must be more rapid. The increase is continued until the effect intended to be obtained from the remedy is produced, or

until its operation is apparent on the system; and whenever the pulse begins to diminish in frequency or force, the increase of dose must be stopt; and if the reduction be considerable, or proceed rapidly, the administration of the remedy must be suspended, and, only after a sufficient interval, cautiously renewed. This is more especially necessary when nausea is induced, dimness of vision, vertigo, or any tendency to fainting. When these symptoms do occur, they are best obviated by small doses of stimulants, as spirituous cordials warm, sulphurick ether, aromatick spirit of ammonia, bitter infusions, and aromaticks, small doses of opium, and a blister applied to the region of the stomach. Vinegar, which is an antidote to other narcoticks, might also be tried.

Foxglove has been considered as a narcotick; it is a still more important article of the materia medica as a diuretick. It had frequently been used as an empirical remedy in dropsy; but the occasional violence of its narcotick operation, when not administered with due precaution, prevented it from being employed in practice, until Dr. Withering pointed out, with more precision, the rules to be attended to in its exhibition.

It is difficult to compare the powers of the principal diureticks; yet, on the whole, perhaps foxglove is superiour to all of them in evacuating the water in dropsy: and the conclusions of Withering are still nearly just, that "so far as the removal of the water will contribute to cure the patient, so far may be expected from this medicine; and that although digitalis does not act universally as a diuretick, it does so more generally than any other."

In hydrothorax, its superiority to other diureticks is more clearly established than in ascites or anasarca; and in the first of these states of dropsy, it is unquestionably superiour to any other remedy. Withering remarked, that it was most successful in those cases of dropsy in which debility was completely marked, where the countenance is pale, the pulse weak, and the muscular energy reduced, while, in an opposite state of the system, it was more liable to fail. In the latter case, therefore, he recommended a previous exhibition of squill, or of super-tartrite of potass, by which some reduction of strength might be induced. The observation, however, has not altogether been confirmed by subsequent experience. If it were, it would afford a strong presumptive proof, that the efficacy of foxglove in dropsy depends on its stimulant action.

There is a peculiarity in its operation, that it may be continued for some time without sensibly increasing the flow of urine; the increase then suddenly commences, and continues of itself without requiring the continued administration of the remedy for several days, and to a very great extent, so that the dropsical effusion is more speedily reduced by the action of it than by any other diuretick. Its diuretick power too appears only when it is administered in dropsy; and hence there can be little doubt that it operates principally, if not entirely, by exciting the action of the absorbents. The absorbed fluid is then discharged by the kidneys. The diuretick effect is not connected with its nauseating operation, or with the reduction in the force of the circulation; it can, on the contrary, be obtained without either of these accompanying it; and Withering remarked even, that he had found the increased discharge of urine to be checked, when the doses had been imprudently urged so as to occasion sickness. He observed also, that if it purges, it is almost certain to fail.

The great desideratum with regard to this remedy, is to conduct its administration so as to obtain its full diuretick effect, without those consequences which arise from it when its action is accumulated in the system. The rules given by Withering for its administration, are to give it in a dose from one to three grains of the powder twice a day; or one ounce of the infusion, which, if the symptoms be urgent, or the patient stronger than usual, may be given once in eight hours: and the dose is to be continued until the medicine either acts on the kidneys, the stomach, the pulse, or the bowels; and is to be stopped on the first appearance of any of these effects. If however the dose be small, and given twice in twenty-four hours, the diuretick operation will be obtained in no long time without any unpleasant symptom; and when it commences, will continue of itself, even though the dose be suspended.

Foxglove may, in the treatment of dropsy, be advantageously combined with other diureticks; and its action, like that of squill, is said to be promoted by the operation of mercury.

There are other diseases in which foxglove has been supposed to prove useful by its diuretick power; as in insania, or in epilepsy connected with serous effusion in the brain; and more especially in dyspnœa arising from

serous effusion in the bronchiæ. It is employed also with much advantage in humoral asthma, and in catarrh, obviously from its power of promoting absorption. By diminishing the quantity of the fluid accumulated in the lungs, it facilitates the expectoration of the remainder, and hence appears to act as an expectorant. In aneurism of the aorta, digitalis has been found to alleviate the most distressing symptoms. Two cases of phthisis are mentioned by Dr. Walmsley, in which this remedy induced a copious ptyalism which lasted some time, but without producing any beneficial effect. In the second case, the ptyalism was a second time induced by its use.

Dr. Currie, late of Liverpool, extols in strong terms the efficacy of foxglove in allaying the inordinate action of the heart and arteries; and in this view he considered it as one of the greatest benefits our science has received in modern times. He employed it very extensively in cases of phlegmasiæ, hæmorrhagia and dropsy, inflammation of the brain, of the heart, and of the lungs; and found it also an excellent remedy in inflammatory rheumatism. Its efficacy in this last disease has been confirmed by more recent experience.

The infusion of foxglove has been applied externally as an anodyne lotion to painful cutaneous eruption or ulceration. An ointment composed of the powder mixed with lard, has been found successful in obstinate tinea capitis.

In the United States practical inquiries into the medical properties of digitalis have been prosecuted with uncommon zeal; and although uniformity of opinion is far from prevailing, every practitioner, who has adopted the use of it, will allow that it is one of the most active medicinal agents. Dr. Isaac Rand, a physician of eminence in Boston, and Dr. John Spence, a respectable practitioner in Virginia, have from their own experience furnished unquestionable attestations of its efficacy in the early stages of phthisis pulmonalis. Although Dr. Rand does not think with Dr. Beddoes, that foxglove is as infallible a remedy in consumption as mercury in lues venerea, and bark in intermittents, he asserts that he has cured more by this medicine than by all and every other medicine conjoined. He has also experienced the most decided good effects from the use of digitalis in hæmoptysis, epistaxis, and active hæmorrhages from the uterus. In one instance of hæmoptysis in a very athletick young

man, where the discharge eluded the force of every other medicine, it reduced the pulse in eight hours from one hundred in a minute to fifty pulsations, and stopped the hæmorrhage. He has given it with complete success in a case of mental derangement. Such are the active and virulent qualities of this plant that it ought not to be intrusted to the direction of the inexperienced practitioner; nor resorted to without due attention to the state of the system; and when administered, its peculiar effects should be discriminated with the utmost vigilance and precision. Dr. Rand relates for admonition one melancholy example of the fatal effects of digitalis in a man, who having experienced relief from its use, adventurously exceeded the extent enjoined by his physician.

It should be observed that there is a singularity attending the operation of foxglove noticed by a writer in the third volume of the Edinburgh Medical Journal, and also by Dr. Hamilton in his treatise on digitalis, and some others, which appears to merit attention in its administration. That its action is considerably influenced by the different positions of the patient's body, whether erect or recumbent. In one case of phthisis, after taking this medicine, the pulse was not lessened in frequency when the patient stood erect, being upwards of a hundred. When he sat down it fell considerably, and when lying on his back it fell much more. When sitting it was reduced to seventy-five, and when lying, to forty. The experiment was repeated many times, and always with the same effect.

Dr. Mease, of Philadelphia, being of opinion that not unfrequently disappointment to the expectations of the prescriber is to be attributed to the improper manner of preparing and exhibiting digitalis, advises physicians to cultivate the plant for their own use, and to observe the greatest care in preserving the leaves, rejecting the leaf stalk and middle rib. The leaves should be gathered when the plant is in blossom, carefully dried, and kept in bottles, and not exposed to the light. Some farther observations relative to this important plant will be found under its several preparations.

The learned and venerable Andrew Duncan, sen. M. D. of Edinburgh, has presented to the publick a very interesting and instructive volume on phthisis pulmonalis, in which he observes, that he has not witnessed any great

benefit from digitalis in any case of phthisis, and that it is in vain to expect a radical cure from its use.

DOLICHOS PRURIENS. *Cowhage.* The stiff hairs which cover the pods.

An exotick plant growing in warm climates, especially the West Indies. The pods are about four inches long, round, and as thick as a man's finger. The outside of the pods is thickly beset with stiff brown hairs, which, when applied to the skin, occasion a most intolerable itching. The ripe pods are dipped in syrup, which is again scraped off with a knife. When the syrup is rendered by the hairs as thick as honey, it is fit for use. It acts mechanically, as an anthelmintick, occasions no uneasiness in the primæ viæ, which are defended by mucus, and may be safely taken, from a teaspoonful to a table spoonful, in the morning, fasting. The worms are said to appear with the second or third dose, and, by means of a purge, in some cases the stools have consisted entirely of worms. A decoction of the roots of cowhage is esteemed a powerful diuretick; and a vinous infusion of the pods (twelve to a quart) is said to be a certain remedy for the dropsy; the dose half a pint when made into beer.

Mr. Kerr has given a botanical description of the plant in the Medical Commentaries, vol. ii.

DORSTENIA CONTRAJERVA. *Contrayerva.* The root.

This plant is perennial, and grows in South America, and some of the Caribbean Islands. The root is knotty, an inch or two in length, and about half an inch in thickness; externally of a reddish brown colour; and pale within; long, rough, slender fibres shoot out from all sides of it, and are generally loaded with small, round knots. It has a peculiar kind of aromatick smell, and a somewhat astringent, warm, bitterish taste, with a slight and sweetish kind of acrimony when long chewed. Contrayerva is a gentle stimulant and diaphoretick, and is sometimes given in exanthematous diseases, typhus, and dysentery. Its dose is about half a drachm of the powdered root.

EUGENIA CARYOPHYLLATA. *The Clove Tree.* The flower bud, and its volatile oil.

This is a beautiful tall tree, a native of the Molucca Islands. Cloves are the unexpanded flowers, which are dried by fumigating them, and exposing them to the sun. They have a strong aromatick odour, and a pungent taste. They afford to water their flavour principally; to alcohol, their taste. By distillation with water, they yield a fragrant essential oil, not very pungent. The oil of cloves, commonly met with, is rendered acrid by certain additions.

Cloves are among the most stimulating aromaticks: the dose of them does not exceed from five to ten grains. They are employed principally as adjuvants, or corrigents to other medicines. The essential oil is used with the same intention, and likewise, as a local application in toothache; but from its pungent nature, it is apt to corrode the gums, and injure the adjacent teeth.

EUPATORIUM PERFOLIATUM. *Thoroughwort. Boneset.* The leaves and flowers.

There are numerous species of eupatorium which are natives of our soil. This species has long been familiarly known throughout the United States by the various names of thoroughwort, boneset, Indian sage, crosswort, vegetable antimony, &c. It grows abundantly in low meadows and marshy situations. The stem is erect, and rises from two to four or five feet, perforating the leaves at each joint, and is hairy or woolly, and branches only at the top. The leaves are horizontal, serrated and rough, from three to four inches long, and about one inch broad at their base, gradually lessening to a very acute point, of a dark green, and covered with short hairs. The flowers are white, and appear in July and August, forming a corymbus at the termination of the branches. The medicinal properties of this very valuable plant have been accurately investigated by Dr. Andrew Anderson, of New York.* His investigation is judicious, and his experiments executed in a manner which merits commendation. He has ascertained its chemical properties by accurate analysis, and

* See his inaugural dissertation, published in New York, 1813.

its medical virtues by practical experiments. Hence he deems it warrantable to conclude that it possesses many properties similar to those which characterize the cinchona officinalis, the anthemis nobilis, and other valuable articles of the materia medica; but that these virtues reside in greatest quantity in the *leaves*.

As pharmaceutical preparations of this plant the author recommends the decoction of the flowers and of the leaves; infusions of the same parts; the leaves in substance pulverized; and a tincture of the flowers and of the leaves, prepared with proof spirits. This last form is the most pleasant and convenient, and at the same time the most powerful, for proof spirits was ascertained to be the best menstruum. Our author does not hesitate to assert that the chemical properties of E. Perfoliatum, as deduced from experiment, are in very many respects exactly similar to the Peruvian bark; and that for its active medicinal virtues, particularly as a sudorifick and as a tonick, it will not suffer by comparison with any of the articles drawn from the vegetable kingdom. In addition to his own opportunities of witnessing the employment of this plant, in different diseases in the New York almshouse, he appeals to the observations and experience of several distinguished practitioners, particularly of Dr. Barton and Dr. Hosack, for the importance and efficacy of this remedy in the treatment of most febrile disorders, particularly in intermitting and remitting fevers, yellow fever, and in other disorders of specifick contagion; in many cutaneous affections, and in diseases of general debility. It may however be observed, that if it be exhibited as a warm decoction, it often proves emetick, and acts especially upon the skin, in producing diaphoresis: if in the form of cold infusion or decoction, or in substance, it acts as a powerful tonick. Dr. Anderson proceeds to detail six cases of intermittent fever in which, after a single evacuant, the thoroughwort effected radical cures; and adds, that the same remedy was administered in almost all the instances of intermittents that occurred in the New York almshouse in the year 1812, to the exclusion of the Peruvian bark, and with uniform success. It was given either in decoction, or in powder, from twenty to thirty grains, every second hour during the intermission. In remitting fever, as a sudorifick, it produced the most salutary effects; and in those cases where tonicks were indicated it proved no less advantageous. In

the treatment of yellow fever he adduces the high authority of Dr. Hosack and Dr. Bard, who, after proper evacuations, placed almost exclusive dependence on sudorificks; and among this class of medicines the eupatorium, administered in the form of decoction, was deservedly considered of great value. The disease called by some the *petechial* or *spotted fever*, and by others the *malignant pleurisy*, or *typhoid peripneumony*, has been more successfully treated by the class of remedies denominated sudorificks than by any other; and in many cases of this epidemick which occurred in the city of New York, in the winter of 1812–13, after the proper evacuations had been employed, the eupatorium was resorted to, and its sudorifick, its tonick and its cordial properties were clearly demonstrated, and much benefit was derived from its use. In some obstinate cutaneous diseases, according to Dr. Barton, eupatorium has produced very beneficial effects. During the author's attendance in the New York almshouse, in the year 1812, very liberal recourse was had to this remedy in diseases arising from general debility. In anasarcous affections of the extremities, and in ascites, when it may be considered as a disease of debility, the alcoholick tincture of eupatorium may be safely recommended as an excellent tonick; and in addition to its tonick effects, the properties of a diuretick render the employment of it still more advantageous in cases of this description.

An infusion of thoroughwort has long been esteemed as an efficacious remedy in bilious colick accompanied by obstinate constipation. It is directed to the quantity of a teacup full every half hour until it produce a cathartick effect. In a similar manner it has been successfully prescribed in dysentery with the view of both its cathartick and diaphoretick properties. About two quarts of a strong infusion of thoroughwort, with the addition of one ounce of aloes, form an excellent purgative for horses and cattle.

Eupatorium Pilosum. *Wild Hoarhound.* The leaves.

This species of eupatorium is also an annual plant; it rises from one to two feet. It grows wild in abundance in the southern states, where it has acquired great repute as a domestick remedy in the prevalent fevers of that climate. We are indebted to the honourable George

Jones, Esq. president of the Georgia medical society, for the following sketch of its medical virtues. "It serves as an excellent substitute for the Peruvian bark; indeed, among the planters on or near the seaboard it supersedes the use of the bark in the cure of fevers. It is tonick, diaphoretick, diuretick, and mildly cathartick, and does not oppress the stomach as the Peruvian bark is apt to do; hence it may often be exhibited where the cinchona is inadmissible. It is usually exhibited in the form of infusion; one ounce of the dried leaves infused in a quart of water may be taken daily in doses of from two to four ounces every hour or two. It may be advantageously combined with Peruvian bark; and although it may sometimes fail of producing the desired effect, I think it well deserves a station among the articles of the materia medica."

EUPATORIUM PURPUREUM. *Trumpet weed. Gravel root.*

The root.

"A tall plant growing about the borders of thickets in wet land. Stem five or six feet in height, straight, round, purplish, hollow throughout its whole length, its tube not being interrupted by joints. Leaves in whorles of 4, 5, or 6; ovate, rugged with veins, acute. Flowers purple, in a large branching terminal corymb—August, September. Perennial." This plant is an excellent diuretick, affording great relief in dysuria and other affections of the urinary passages, increasing the secretion of urine in dropsy, &c. The root is the part employed, and is given in the form of infusion or decoction, in a liberal manner, until the desired effect is produced.

FERRUM. *Iron.*

A metal very abundant in nature, of a bluish gray colour, highly ductile, scarcely fusible, but easily oxidated in atmospherick air, and subject to rust. It seems even to be a constituent of organick substances, and is the only metal, which, when taken into the stomach, exerts no deleterious action upon it.

The general virtues of this metal, and the several preparations of it, are, to constringe the fibres, to quicken the circulation, to promote the deficient secretions in the remoter parts, and at the same time to repress inordinate

discharges into the intestinal tube. After the use of them, if they take effect, the pulse is very sensibly raised; the colour of the face, though before pale, changes to a florid red; the alvine, urinary, and cuticular excretions, are increased. Fetid eructations, and the feces voided of a black colour, are marks of their taking due effect.

When given improperly, or to excess, iron produces headache, anxiety; heats the body, and often causes hæmorrhagies, or even vomiting, pains in the stomach, and spasms and pains of the bowels.

Iron is given in most cases of debility and relaxation;

1. In passive hæmorrhagies.
2. In dyspepsia, hysteria, and chlorosis.
3. In most of the cachexiæ.
4. In general debility produced by disease, or excessive hæmorrhagy.

When either a preternatural discharge, or suppression of natural secretions, proceed from a langour and sluggishness of the fluids, and weakness of the solids, this metal, by increasing the motion of the former, and the strength of the latter, will suppress the flux, or remove the suppression; but where the circulation is already too quick, the solids too tense and rigid, where there is any stricture or spasmodick contraction of the vessels, iron, and all the preparations of it, will aggravate both distempers. Its powers have of late been applied for the cure of cancer by the suggestion of Mr. Carmical. His practice is to give small and repeated doses for a length of time, and at the same time the ulcers are to be dressed by the powdered carbonate or the diluted muriatick tincture.

Soft malleable iron is the only kind fit for internal use, as steel and cast iron always contain impurities, and often arsenick. As its mechanical division is extremely difficult, it is directed to be kept in the shops in the state of filings or wire.

FERRI OXIDUM NIGRUM. *The black oxide of iron, such as are the scales of iron, formed at the foot of the blacksmith's anvil.*

When iron is heated to redness in the smith's forge, to render it more malleable, its surface becomes oxidized by the action of the atmospherick air; and as the oxide formed does not adhere to the iron, it is easily separated

by percussion on the anvil, and flies off in the state of sparks, which, on cooling, constitute the scales of iron. In these, the iron is oxidized to that degree in which it is soluble in acids, without the production of hydrogen gas: therefore, when taken into the stomach, they do not produce the distention and flatulence occasioned by the use of the filings. These scales are purified for use by the application of the magnet. For the magnet will attract only the smaller and purer scales, and will leave those which are larger and less pure.

Ferula Assa Foetida. *Assa Fœtida.* The gum-resin.

The plant which furnishes assa fœtida is perennial, and a native of Persia. It has, however, borne fertile seeds in the open air, in the botanical garden of Edinburgh. The gum-resin is procured from the roots of plants which are at least four years old. The top of the root is cut off transversely, and the juice suffered to exude, which is afterwards exposed to the heat of the sun to harden. It comes to us in large irregular masses, composed of various little shining lumps or grains, which are partly of a whitish colour, partly reddish, and partly of a violet hue. Those masses are accounted the best, which are clear, of a pale reddish colour, and variegated with a great number of elegant white tears. This drug has a strong fœtid smell, somewhat like that of garlick; and a bitter, acrid, biting taste. It loses some of its smell and strength by keeping; a circumstance to be particularly regarded in its exhibition. It is the most powerful of all the fœtid gums, and is a most valuable remedy. It acts as a stimulant, antispasmodick, expectorant, emmenagogue, and anthelmintick. Its action is quick and penetrating, and it affords great and speedy relief in spasmodick, flatulent, hysterick, and hypochondriacal complaints, especially when they arise from obstructions of the bowels. Where spasms and constipations have weakened the powers of nature, and the functions are in a languid state, it generally affords effectual relief; as it promotes digestion, enlivens the animal spirits, and, by increasing the peristaltick motion of the intestines, tends to open them in persons of an advanced age. In the spasmodick, as well as humoral asthma, unattended with fever, it is an excellent remedy; for, in the former, it counteracts the strictures of the respiring organs, and in the latter, greatly

facilitates expectoration. The hooping cough has been cured, and worms have frequently been expelled, by the conjoined administration of assa fœtida, both by the mouth and in the form of clyster. It is exhibited in the form of pills, in doses of from five to twenty grains, either alone, or combined with bitter extracts or purgatives; or it may be given in tincture, or dissolved in some simple distilled water. In the form of clyster, it is frequently directed to the extent of two drachms, dissolved in eight ounces of water, as an antispasmodick.

FICUS CARICA. *The fig tree.* The fruit.

This tree is probably a native of Asia, but grows plentifully in the south of Europe. As the fruit is very pulpy, it is dried when it is to be preserved. They consist almost entirely of sugar and mucilage, and are therefore demulcent. They are grateful to the stomach, and more easy of digestion than any other sweet fruit; and abounding in saccharine matter, they are very nutritious, but apt to occasion flatulency, when eaten without bread, or other mealy substances. A decoction of figs affords excellent gargles to cleanse the throat and mouth. This fruit also forms an ingredient in lenitive electuaries, and pectoral draughts, and is likewise applied externally to soften, digest, and promote maturation.

Figs ripen very well by the middle of September, in Philadelphia, when enjoying a free exposure to the sun. In the southern states they flourish luxuriantly, and might become an article of extensive exportation, and home consumption, if pains were taken to introduce the large Levant fig.

FRASERA CAROLINENSIS, *Walth.* } *Columbo of Marietta.*
FRASERA WALTHERI, *Mich.* } The root.

This species of columbo is produced in the vicinity of Marietta in Ohio, and we are indebted to Dr. S. P. Hildreth of that place for a partial description of the plant. According to him the Columba Americana is a regular and very elegantly proportioned plant, growing to the height of seven feet.

It is a production of high land, a rich and loamy soil that is covered with white oak, white thorn, and tufts of prairie grass. The stalk is covered with a smooth deli-

cate membrane of a deep purple colour at the root, but becoming lighter as it ascends toward the top. Beneath this is a pulpy coat, fibrous and vascular, which covers another that is entirely ligneous, which is the chief support of the stalk. The remainder is medullary, and completely fills the woody circle. The columbo of Marietta is a triennial plant. The radical leaves, when it springs from the seed, are five in number; to these are added the second season five more. The third spring it sends up a stalk with five whorls of leaves, when each whorl consists of *five leaves;* and *four*, when each whorl consists of *four*, before it puts out any flowering branches. The leaves are in whorls smooth and spear shaped. The branches are axillary, upright, and of the same number with the leaves, from the basis of which they immediately rise and send out opposite fruit stalks. From the whorls where the flowering branches commence, to the top of the stalk, if it consists of five leaves, there are ten whorls growing gradually less to the apex, which ends with five peduncles. It flowers in July. The root as soon as it enters the earth shoots out in a horizontal direction; is spindle shaped; and when well grown is from eighteen to thirty inches in length, and two in diameter at the turn. Near the surface of the earth the root is wrinkled; its colour in the young plant is a light yellow; and is solid and brittle. After the stalk is grown the root becomes softer and less bitter. The proper time for collecting it seems to be in the spring of the third year. Dr. Hildreth asserts, that from the experiments he has made with American columbo, he is induced to believe it fully equal, if not superiour, to the imported. It is in common use there, and has in one instance, in the heat of summer, put a stop to a wide spreading gangrene, on one of the lower extremities, by internal use and external application, when bark and other remedies had failed.

The columbo plant is undoubtedly to be estimated as a valuable acquisition to our materia medica. The root, however, is found on examination to be of a lighter colour, and to possess less of the bitter principle than the imported root; its comparative efficacy is therefore doubtful, and yet to be ascertained. This plant is found in the swamps of South Carolina, and on the borders of the lakes in Pennsylvania and New York.

Fraxinus Ornus. *Manna Ash.* The concrete juice, called manna.

Manna is obtained from other species of fraxinus besides the ornus, and especially from the rotundifolia. It is principally collected in Calabria and Sicily. In the warmest season of the year, from the middle of June to the end of July, a clear juice exudes from the stem and branches of these trees, which, when naturally concreted on the plants and scraped off, is called manna. The best Calabrian manna is imported in oblong, light, friable flakes, or pieces of a whitish or pale yellow shade, and somewhat transparent. The inferiour sorts are moist, unctuous, and of a darker colour.

Manna is a mild and agreeable laxative, which may be safely administered to children and the aged, though in some constitutions it is apt to induce flatulence, and to distend the bowels; but this inconvenience may be remedied by the addition of a little cinnamon water, or other warm aromatick. The dose for children is according to their age, from one to three drachms, and for adults, one ounce, or one ounce and a half; as, however, its operation when by itself, is very mild, and sometimes imperceptible, it is generally given in laxative mineral waters, or combined with salts, senna, rhubarb, or similar aperient medicines.

Manna is also one of the most useful demulcents in the humid asthma, and similar pituitous as well as inflammatory affections of the breast; it also beneficially promotes expectoration, and is of peculiar service in the second stage of the small pox, or during the suppuration of the pustules.

Gambogia. *Gamboge.* A gum-resin.

A concrete vegetable juice, of a gummy, resinous nature. It issues from the cambogia gutta, a native of Cambia, in the East Indies; whence it is imported in large cakes or rolls. The best sort is of a deep yellow colour; is divested of all smell, and has very little taste. When taken as a medicine it operates violently, both upwards and downwards. It has been used in dropsies with cream of tartar, or jalap, or with both, to accelerate their operation; but calomel has been found to be a useful addition to gamboge in dropsical cases. Gamboge is also recom-

mended to be taken for the expulsion of the tape-worm, in doses of fifteen grains, early in the morning; and, if the worm be not expelled in two or three hours, this powerful dose is said to have been repeated with safety and success, even to the third time, and in persons of delicate habits. Great precaution, however, is requisite in the use of this precarious and active medicine; and, if accidentally, too large a dose of it should be swallowed, the most effectual antidote will be copious draughts of a solution of pearl ashes in water.

GENTIANA LUTEA. *Gentian.* The root.

Gentian is a perennial plant which grows upon the Alps, Pyrennees, and other mountainous parts of Europe. The roots are long and thick, externally of a brown colour, and wrinkled; internally spongy, and of a yellow colour, without any remarkable smell, but surpassing all other European vegetables in bitterness. Alcohol dissolves only the bitter extractive; water, both the extractive and mucilage. Gentian possesses the general virtues of bitters in an eminent degree, and is wholly devoid of astringency. Taken into the stomach, it proves a powerful tonick; and in large doses, it evacuates the intestines. It is useful in debility of the stomach, in general debility, and in gout: combined with astringents, it cures intermittents. The dose of this drug in powder, is from ten to forty grains; though it is more frequently taken as the chief ingredient in bitter wines, tinctures, and infusions. There are several species of gentian in the United States. Dr. Shoepf particularly praises a low species with narrow leaves which he found in the glades in Pennsylvania.

GENTIANA CATESBŒI. *Blue Gentian.* The root.

There are several species of gentian in the United States. We are indebted to professor Bigelow for the following account of this new article. The gentiana catesbœi has a branching and somewhat fleshy root. Stem simple, erect, rough. Leaves opposite. ovate or lanceolate, slightly three nerved, acute, rough on the margin. Flowers crowded, nearly sessile, axillary and terminal, blue. The dried root of this vegetable is intensely bitter, approaching nearly to that of the officinal gentian. Dr. Bigelow found in a variety of instances in which he used it, to resemble very nearly the imported gentian in

its properties, being but little inferiour to it in strength or efficacy. Like that substance it invigorates the stomach and gives relief in complaints arising from indigestion. Dr. Macbride, he observes, entertained a high opinion of its tonick power in cases of debility of the stomach and digestive organs. He further adds, "In Mr. 'Elliot's Botany of the southern states, we are told, that in the form of a decoction it is used with decided advantage in cases of pneumonia, where the fever is nervous, and that it acts as a tonick and sudorifick. A tincture of it is esteemed as a remedy in dyspepsia, given in doses of one fourth or half an ounce. It is said to increase the appetite, prevent the acidification of the food, and to enable the stomach to bear and digest articles of diet, which before produced oppression and dejection of spirits."

GEOFFRÆA INERMIS. *Cabbage bark tree.* The bark.

The bark of this tree, which grows in Jamaica, is of a gray colour externally, but black, and furrowed on the inside. The powder resembles jalap, but is not so heavy. It has a mucilaginous and sweetish taste, and a disagreeable smell. Its medical effects are much greater than its sensible qualities would lead us to expect. It is given in cases of worms in form of powder, decoction, syrup, and extract. The decoction is preferable, and is made by slowly boiling an ounce of the fresh dried bark, in a quart of water, till it assume the colour of Madeira wine. This sweetened, is the syrup; evaporated, it forms an extract. It commonly produces some sickness and purging; sometimes more violent effects, as vomiting, delirium, and fever. These last are said to be owing to an over dose, or to drinking cold water; and are relieved by warm water, castor oil, or a vegetable acid. It should always be given at first in small doses; and, when properly and cautiously administered, it operates as a very powerful anthelmintick, particularly for the expulsion of the lumbrici, which are a very common cause of disease in the West India Islands; and there it is very frequently employed, with singular success.

GERANIUM MACULATUM. *Spotted Geranium, or Cranes Bill.* The root.

This is a native plant very common about fences and the edges of woods, preferring a soil that is somewhat

moist. "Stems erect, hairy, dividing by forks, or more numerous branches, one or two feet high. Leaves large, spreading, hairy, divided in a palmate manner into five or seven lobes, which are variously cut and toothed at their extremities, the lower petioled, the upper ones nearly sessile. As the leaves grow old, they are usually marked with pale spots about the sinuses. Peduncles long, hairy, supporting about two flowers. Calyx five leaved, those edges which are outermost in the bud, hairy. Petals rounded, blue. Fruit ending in a long beak, containing five awns, which spring out and scatter the seeds when ripe. May and June. Perennial."

Geranium has acquired much repute for its active astringent properties. The root boiled in milk is a common domestick remedy in cholera infantum, after evacuations, in which its efficacy seems well established where it has been employed. In the last stage of dysentery and diarrhœa, after proper evacuations, this medicine has proved highly beneficial. Dr. Mease mentions this plant as being a powerful astringent, and says it will stop very violent bleeding, if applied to the wounded vessel. Mr. Bartram informed him that he stopped a most profuse hæmorrhage in the ankle which had been cut with an adze, by applying this plant to the part. A decoction or infusion of the plant has on some trials manifested great efficacy in restraining internal hæmorrhage. I have found the infusion to restrain in the speediest manner hæmorrhage from the lungs, and to afford great relief as a gargle, in a case of severe ulcerated mouth from mercurial ptyalism. Professor Bigelow, from chemical examination, has ascertained the root of geranium to be one of the most powerful astringents we possess, and from its decided properties, as well as the ease of procuring it, he observes it may well supersede in medicine many foreign articles of its class which are consumed among us. Its internal use has been recommended in the last stages of dysentery and cholera infantum, after suitable evacuations have removed active inflammation and the exciting causes. "The tincture has a great sensible astringency, and is a convenient mode for keeping the article for use. The root may be used in powder, in extract, or in tincture. Its doses are similar to those of kino and catechu, a drachm or two of the tincture, twenty or thirty grains of the powder, and a quantity somewhat less of the extract." Dr. Coxe observes, that the western Indians say it is the

most effectual of all their remedies for the venereal disease. In Dr. Barton's collections it is asserted that an aqueous infusion of the roots forms an excellent injection in gonorrhœa and in old gleets.

Geum Urbanum. *Common Avens, or Herb-bennet.* The root.

This plant grows by fences and borders of fields, the blossoms are white or yellowish in July. According to Dr. Willich the root of avens has lately been employed in Europe with singular efficacy in the cure of obstinate agues. A strong tincture of the root given to the quantity of half an ounce, or the decoction, or powder, in doses of one drachm, several times in a day, has seldom failed to cure intermittents, where the Peruvian bark had proved ineffectual. The root has also afforded an excellent remedy in several chronick disorders, as a general strengthener and astringent, and its antiseptick power is said to be superiour to the best Peruvian bark. Dr. Withering says the roots gathered in the spring, and put into beer, give it a pleasant flavour, and prevent its growing sour.

Geum Rivale. *Water Avens.* The root.

This American species of avens, called also throat root, and cureall, is found in our boggy meadows. According to Rev. Dr. Cutler, the blossoms are purplish in May. The root is powerfully astringent. A decoction of it has been used, with good success, as a gargle; and a drink, in inflamed and ulcerated sore throats and canker. It is said that the powdered root will cure intermittents, and for this purpose it is much used by the Canadians.

Glycyrrhiza Glabra. *Liquorice.* The root and extract.

Liquorice is a perennial plant, and a native of the south of Europe, but is cultivated in considerable quantities in England, for medicinal purposes. The root of this plant has a sweet agreeable taste. This sweetness is extracted by water, by infusion or decoction; and, by evaporation, a dark coloured extract, of the same sweet taste, is obtained, consisting principally of saccharine and mucilaginous matter. Liquorice root is a pleasant demulcent,

which is frequently added to infusions of linseed or althæa.

There is no doubt of its gentle deterging qualities, which render it an excellent medicine in coughs, hoarseness, asthma, &c. for lubricating the throat, softening acrimonious humours, and affording relief to the organs of respiration. But with this intention it ought to be taken as a diet drink in considerable portions by way of infusion. This plant is found in the state of Vermont, and on the borders of the Ohio river.

GUAJACUM OFFICINALE. *Officinal Guaiacum.* The wood and resin.

Guaiacum, or lignum vitæ, is a genus of plants producing three species, the principal of which is the officinale, or common lignum vitæ, a native of the West Indies. The wood of this tree, and the gum resin obtained by exudation from incisions in its trunk, are the parts of it used in medicine.

The wood is hard and heavy, of a yellow colour, has little smell, and a moderately bitter taste. Its virtues depend on the small portion of resinous matter which it contains.

Gum guaiacum is of a friable nature, of a deep greenish colour, and sometimes of a reddish hue, and has a pungent acrid taste. It is a stimulating medicine, proving diaphoretick in a dose of about half a drachm, and purgative in a larger dose. Its sudorifick powers is promoted by opium, or the preparations of antimony.

This medicine was introduced into practice as a remedy in the treatment of lues venerea, and was at one time considered capable of effecting a radical cure. Its powers are now better ascertained. It is employed, and with some advantage, in promoting the action of mercury in the confirmed state of the disease, and in alleviating the various symptoms which arise from a protracted mercurial course. The general virtues of guaiacum, are those of a warm aromatick medicine; it strengthens the stomach and other viscera, and greatly promotes the discharge of urine and perspiration. Hence it is of especial service in cutaneous eruptions, and disorders arising from obstructions of the excretory glands; in rheumatick, and other pains, unattended with fever, the liberal use of gum guaiacum has afforded considerable relief. It is likewise

a good laxative, and furnishes a more active medicine than either the wood or bark of this tree. This gum, when dissolved in rum, or combined with water, by means of mucilage or the yolk of an egg, or in the form of tincture and elixir, has been found useful in chronick rheumatism, or even in such wandering pains of the stomach and other parts of the body, as could be attributed to the retrocedent gout.

The form in which guaiack wood is administered, is always that of decoction. A quart of it is drunk in the course of the day. If taken warm, it produces diaphoresis.

HAMAMELIS VIRGINIANA. *Witch Hazel.* The bark.

This tree is a native of the United States. The leaves are nearly inversely ovate. Blossoms, yellow: stand three or four together on short flower stalks. In loamy land. Blossoms, September and October. This singular shrub does not commonly bloom until its leaves are destroyed by frost, when its numerous blossoms make a gay and agreeable appearance; and continue until the weather becomes very cold, often until snow falls. The germen endures the severity of our winters uninjured; for the fruit does not ripen until the next September, the time of its blossoming again, when ripe fruit and blossoms will be found on the same tree. The Indians considered this tree as a valuable article in their *materia medica.* They applied the bark, which is sedative and discutient, to painful tumours and external inflammations. A cataplasm of the inner rind of the bark, is found to be very efficacious in removing painful inflammations of the eyes. The bark chewed in the mouth is, at first, somewhat bitter, very sensibly astringent, and then leaves a pungent, sweetish taste, which will remain for a considerable time. The specifick qualities of this tree seem by no means to be accurately ascertained. It is probably possessed of very valuable properties. *Cutler.*

Mr. Bartram informs, that this shrub grows ten or twelve feet high, from one common root.

HÆMATOXYLUM CAMPECHIANUM. *Logwood Tree.* The wood.

This tree was introduced from Honduras into Jamaica, where it is now very common. Logwood is of a deep red colour; has scarcely any smell; its taste is sweetish, and astringent. It is used principally as a dye-wood, and also with considerable advantage in medicine. Its active matter is extracted by water, and by alcohol; both solutions strike a black colour with the salt of iron.

It has been employed in medicine on account of its astringent powers. A table spoonful of a decoction or infusion of the wood every two or three hours is much esteemed by some physicians as an astringent in chronick dysentery, diarrhœa, and cholera infantum.

HELLEBORUS NIGER. *Black Hellebore.* The root.

This plant is perennial, and grows wild in the mountainous parts of Austria, and the Pyrennees. The root of this plant consists of small fibres attached to one head; externally dark coloured, internally white. Its taste is very acrid, but the acrimony is much impaired by drying and keeping.

Its medicinal power seems principally to depend on its resinous part. By decoction with water, it yields half its weight of gummy matter, with some resin; the extract obtained by inspissation is milder than the root itself.

Black hellebore root is a very violent cathartick, in a dose from ten to twenty grains; so violent, indeed, that it is seldom used. On its cathartick power probably depends any advantage that may be derived from its administration in mania and melancholia, in which diseases it was highly celebrated by the ancients. In dropsy it has been employed as a hydragogue cathartick. It was likewise strongly recommended by Mead as an emmenagogue, though with others it has seldom been successful.

HELLEBORUS FŒTIDUS. *Bears Foot. Setterwort.* The leaves.

This species is found in meadows, shady places, and under hedges, and is also perennial. The stalk is about

three feet high. The leaves are of a deep green, bird-footed. All of them grow on the stem, none towards the root. It produces numerous green flowers, somewhat tinged with purple at the edges, which blow in April and May. The leaves have an acrid, bitter, nauseous taste, and an unpleasant smell, especially when they are fresh. When dried, they are frequently given as a domestick medicine to destroy worms; but they must be used with great caution, being so violent in their operation, that instances of their fatal effects are recorded. Since we are not destitute of safe and efficacious anthelminticks, this dangerous remedy should be rejected.

HELLEBORUS TRIFOLIUS. *See Coptis Trifolia.*

HERACLEUM LANATUM. *Masterwort. Cow Parsnip.* The root.

This article was brought into notice by the late Dr. Joseph Orne, of Salem. In a communication to the Massachusetts Medical Society, October, 1803, he thus describes it: Common cow parsnip. (*Sphondylium vulgare hirsutum. Park. C. B.*) It grows in hedges; the stalk is large and tubular, invested with a down which also covers the leaves, that are large and jagged, five on each stalk, and of the colour of wormwood; it is umbelliferous, and flowers in June; the root is divided into several long and fibrous branches, resembling a large parsley root; and the height of the plant, in its maturity, may be from two to four feet: the root has a rank strong smell, and a pungent and almost caustick taste; it should be carefully distinguished from the common parsnip, that grows wild in gardens, and hedges; and indeed, it has a very different appearance.

The particular disease in which Dr. Orne commends the cow parsnip, is that of epilepsy. Three of the five cases which are exhibited in his communication, were cured by the use of this medicine. The author judiciously observes, that in the three successful cases, the patients were remarkably liable to flatulence, with symptoms of morbid sensibility of the stomach, and date their first relief from the sensation of a more firm and healthful tone of that organ, and the carminative effects of the medicine. He commonly prescribed two or three drachms of the pulverized root, to be taken every day for a great length of time, and a strong infusion of the leaves and tops to be drunk at bed time.

In the hands of other practitioners, this plant has manifested considerable efficacy, exerting its peculiar powers immediately on the stomach, as an excellent carminative; and, if it does not cure epilepsy, it generally mitigates the distressing symptoms attending that disease. In some cases of dyspepsia, accompanied with flatulencies and cardialgia, a strong decoction of this plant has been given by Dr. Mann with satisfactory success.

HEUCHERA AMERICANA. *American Sanicle. Alum root.*

"The root is an intense astringent; and is the basis of a powder which has lately acquired some reputation in the cure of cancer. It is one of the articles in the materia medica of our Indians. They apply the powdered root to wounds and ulcers and cancers."* (Coxe.)

HIRUDO MEDICINALIS. *The Leech.*

That species of leech which is used in medicine has a flat and slimy body, composed of rings tapering towards the head which is turbinated, commonly about two or three inches long, and of the thickness of a goose quill, but capable of elongating or contracting itself very much. Its back is of a dull olive green colour, divided into three nearly equal parts by four yellow longitudinal lines, the two lateral entire, the two central broken with black. Besides these, between the lateral and central lines on each side, there are two others resembling a chain of black and yellow. The belly is turkey blue, irregularly marked with yellow spots. It attaches itself to solid substances by either end, being furnished with a circular sucker at the anal extremity, and a horse shoe one at the head, with a triangular mouth in the centre.

They should be collected in summer, in water having a clear sandy bottom, as the bite of those found in stagnant waters and marshes is said to cause pain and inflammation. For the same reason the horse leech, which is entirely brown, or only marked with a marginal yellow line, is commonly rejected.

Leeches are best preserved for use in a bottle half filled with pure spring or river water, and covered with gauze or muslin. It is advisable frequently to change the water

* Barton's collections.

in which they are kept, although there are instances of their living many months and even years in the same water; and it is remarkable, water in which they are, keeps much longer sweet than by itself. They should always be kept in a moderate temperature about 50° Fahrenheit. When leeches have gorged themselves with blood, they frequently die of indigestion, and cause a great mortality even among those who have not been used. To avoid this danger, leeches which have recently sucked should be kept by themselves until they have recovered their usual vigour; and a little salt applied to the head of the animal will occasion it to vomit up the blood which it has received. Leeches change their skin frequently; at that time they are subject to indisposition and will not bite.

Leeches are very useful and convenient remedies in every case requiring local blood-letting. They cause less irritation than cupping, and can often be applied nearer to the part. They are employed in inflammations of all kinds, as ophthalmia, phrenitis, cynanche, rheumatism, odontalgia, and podagra. In some cases of rubeola and scarlatina, in hæmorrhois, in plethora of the head, mania, dysuria and chincough.

The application of leeches is sometimes attended with difficulty. In cloudy weather and in the evening, they do not readily bite. If kept out of the water some minutes before they are applied, and allowed to crawl on dry linen. they are said to bite more eagerly. The part to which they are to be applied should be well washed; first with soap and water, and afterwards with water, or milk and water; and if covered with strong hairs, should be shaved. When they are not inclined to bite, the part may be moistened with milk, or a little blood drawn by a scratch with a lancet. A large leech will draw about an ounce of blood; but the quantity may be much increased by bathing the wounds with tepid water, or applying over them cupping glasses. Sometimes it is difficult to stop the bleeding; but it will always cease on applying a little lint, and continuing pressure a sufficient length of time.

Hordeum Distichon. *Barley.* The seed stripped of its husk, called pearl barley.

Barley has from the earliest ages been considered as a wholesome and nutritious food. Pearl barley is prepared by grinding off the husk of rough barley, and forming the

grain into little round granules, which appear of a kind of pearl whiteness. In this state, barley consists almost entirely of amylaceous matter, and when boiled, forms an excellent article of nourishment. In diseases of the kidneys and the breast, as well as in that state of the body where it is said to abound in acrimonious humours, decoctions made of this grain, sufficiently strong, and acidulated with vinegar, are eminently useful. As a cooling and diluent beverage, barley water is of essential service to febrile patients, and in all inflammatory cases, where preternatural heat and thirst prevail; but, to promote its salutary effects, the grosser parts which remain after decoction, ought not to be swallowed.

HUMULUS LUPULUS. *The common Hop.* The flowers.

This perennial plant is a very strong bitter, accompanied with a degree of aromatick flavour and some astringency; these are extracted by water by infusion; by decoction the aromatick flavour is lost. Along with its bitterness it has a narcotick power: of this the popular remedy, sometimes successful, of a pillow of hops to procure sleep in the delirium of fever and in mania, is a proof. It accordingly, when given internally in a full dose, reduces the frequency of the pulse, and procures sleep. It has been employed as an anodyne, either in substance, in the dose of three grains, or under the form of infusion or tincture. A cataplasm or ointment, prepared from it, has been also used as an anodyne application to cancerous sores.

The hop is an excellent stomachick bitter, highly useful in dyspepsia and other gastrick affections. Recently, hop has been administered in nephritick and calculous affections with such manifest advantage as to obtain high encomiums as a valuable antilithick. A strong infusion of hop proves a certain solvent of the stone out of the body, and it is asserted by high authority, that it seldom fails to alleviate the pain, and increase the secretion of urine, when taken internally. Dr. Barton, however, found by experience, in his own peculiar case, that the use of the highly hopped malt liquors subjected him more frequently to nephritick attacks. The infusion is directed in doses of about a wine glass full every few hours, to the extent of a pint in a day.—*See Amer. Mod. Practice, p.* 606, 607.

HYDRARGYRUM. *Argentum Vivum. Mercury or Quicksilver.*

Mercury is sometimes found in a native state in the bowels of the earth. The most celebrated mines which produce it are those of Idria, Hungary, Bohemia, and Carinthia; those of Montpellier, in France, of Normandy, of Spain, and those of Peru. This metal is peculiarly distinguished by its fluidity in all natural temperatures, with the exception of the intense cold that sometimes prevails in very northern regions. Its congealing point is 40° of Fahrenheit. In its liquid state, it has the perfect opacity and lustre characteristick of metals; and likewise the property of great density, its specifick gravity being to that of water as 13.5 to one nearly: it boils at a temperature a little above 600°; and when boiling, suffers oxidation from the action of the atmospherick air. It is oxidated even at natural temperatures, when subjected to agitation; or still more easily when triturated with any viscid matter, which is interposed between its globules, extending their surface. Quicksilver is usually obtained from the ore, in which it is combined with sulphur, this being submitted to heat mixed with iron or lime, either of which combines with the sulphur, and the mercury is obtained by distillation. The quicksilver of commerce is sometimes impure, or adulterated by the intermixture of other metals, particularly lead and bismuth. This may be suspected when the metal loses its lustre speedily, and is covered with a gray film; or from its diminished mobility, in consequence of which its globules do not preserve exactly the spherical form, nor unite easily with each other; and it may be discovered, with more certainty, by exposing it to a heat sufficient to volatilize the quicksilver, when any other metal present will remain. It is best purified by distillation from iron filings in an iron retort. Next to gold and platina, mercury is the heaviest of all the metals, with most of which it unites, excepting iron and antimony. Mercury taken into the stomach, in its metallick state, has no action on the body, except what arises from its weight or bulk. It is not poisonous, as was vulgarly supposed, but perfectly inert. There is nevertheless indubitable evidence that persons who work in the mines, or are otherwise exposed to the fumes of quicksilver, frequently ex-

perience its destructive consequences. Among other diseases arising from this cause, Hoffman mentions palsies, apoplexies, epilepsies, hectick fever, &c. These remarks are corroborated by a recent occurrence which took place on board two vessels, in which, from the fumes of quicksilver, an alarming illness broke out among the crews, all of whom were more or less salivated.

With regard to the medical history of mercury, as recorded by a late writer,* no mention is made of it in the writings of Hippocrates, though Aristotle and his contemporaries were not unacquainted with it. Dioscorides, Pliny, and even Galen, considered it as highly corrosive, and classed it among the poisons. Avicenna was among the foremost who, influenced by the practice of some distinguished Arabian physicians, become reconciled to the opinion of its salutary tendency. In the year 1497, this metal was introduced as a sovereign remedy in lues venerea; and after a warm contention relative to its use, between the chemists and Galenists, it was received as one of the most valuable articles of the materia medica. Among the various substances with which we are acquainted in medicine, the preparations of mercury, as respects their operation on our system, is incomparably the most important; nor have their properties, perhaps, undergone investigation commensurate with their wonderful powers and extensive utility. According to Mr. Murray, a late and truly scientifick writer on materia medica, mercury is placed in the class of tonicks, viewing its tonick power as its primary operation. Its power of exciting the salivary discharge is merely a secondary effect, not constant nor uniform, and which is not essential in any disease. It is the most general stimulant belonging to the materia medica, pervading every part of the system; acting, as Cullen has remarked, as a stimulus to every sensible and moving fibre of the body, and producing the most permanent effects. Hence it is the most general evacuant we possess; and from its stimulant ope-

* Dr. John W. Frances, of New York, in an inaugural dissertation on mercury, has presented a new view of the natural and medical history and curative action of that metal. His production, couched in perspicuous and elegant language, evinces ability, and extensive research relative to a subject of high importance to medical science; and has strong claims to the attention of the physicians of the United States.

ration, exerted directly or indirectly, we are able to explain its utility in many diseases. When rendered active on the system, by any of the modes of preparation to which it is subjected, it is received into the blood, and enabled to act on every part of the system. Hence, when given in moderate quantity, it communicates general vigour; it increases the force of the circulation when this has been languid; by the increased vascular action which it excites, it gives to the blood the disposition to assume the buffy coat; and by its stimulant operation on secreting organs, it promotes the secretions; and hence is the most general evacuant we have. On its stimulant operation probably depends its efficacy in diseases connected with spasmodick action, as tetanus and hydrophobia; and perhaps also that derived from it in various forms of fever, particularly the remitting fever of warm climates, and yellow fever; and its local operation is distinctly marked in the advantage derived from it in chronick hepatitis, and other varieties of visceral and glandular obstructions, and in the different species of cutaneous eruptions. It is frequently employed, and with the utmost advantage, in inflammatory diseases, and in dysentery; in cachectick diseases, as the various species of dropsical affections, and in many chronick morbid states of the system.

Its most important medicinal operation, however, is that displayed in removing the disease induced by the syphilitick poison. In this, its power is nearly, if not altogether specifick; no article of the materia medica could be substituted for it; and then may be affirmed of it, what cannot with equal justice be said of any remedy employed in the treatment of any other morbid affection, that if duly administered, it will scarcely ever fail in effecting a cure. It is difficult to assign any satisfactory theory of its operation. Its efficacy has been ascribed to its general evacuant power, in consequence of which the syphilitick virus is discharged from the body. But the speedy disappearance of the local symptoms of syphilis under its use, affords a proof that it operates on some other principle; no similar advantage is derived from other evacuants; and its efficacy is not proportional to the evacuation it excites, but is frequently displayed where this is altogether insensible. The opinion has been advanced, that it acts as an antidote to the venereal virus, neutralizing it somewhat in the manner in which

one chemical agent subdues the properties of another,—an opinion extremely vague and hypothetical, and rendered improbable from the consideration of the very small quantity of some of the more active preparations of mercury, from which a cure may be obtained, compared with the large quantity of others less active, that requires to be administered.

The explanation advanced by Mr. Hunter, that the efficacy of mercury in the treatment of syphilis depends on its general and permanent stimulant operation on the system, by which it induces and keeps up an action incompatible with that morbid action which constitutes the disease, until the virus is destroyed by the chemical changes going on in the system, or until it is eliminated from the body by the usual excretion, is on the whole most probable: it rests on a principle undoubted, that there are states of morbid action incompatible, so that one suspends the action of the other; and mercury does exert a very general action, inducing and keeping up what may be regarded as a morbid state.

The mode of administering mercury, for the cure of the venereal disease, under all its forms, is now ascertained with sufficient precision. There is no advantage in giving it so as to induce profuse salivation; this is even to be avoided as hurtful; at the same time, it is proper that salivation should be excited to a certain extent, not probably as essential to its efficacy, but as a proof of its full action on the system being obtained. This is kept up for a certain time, longer or shorter, according to the state of the symptoms, and the previous continuance of the disease. Exposure to cold is avoided, as being liable to cause the more partial operation of mercury on the salivary glands; and the state of irritation is diminished, or determination to the intestines producing purging is obviated, by the exhibition of an opiate. When profuse salivation occurs, the remedies employed to check it are catharticks in moderate doses, small doses of opium, the application of a blister to the throat, and the administration of sulphuret of potash; the last being employed from the doubtful hypothesis, that its chemical agency may neutralize the mercury. Free exposure to a cool air is, according to Mr. Pearson, more effectual than any other method. Peruvian bark, mineral acids, and the assiduous application of astringent gargles have their use, while the employment of mercury must be discontinued for a

time. On the other hand, the sudden suppression of ptyalism is not without danger. It is most frequently caused by cold liquids being taken into the stomach, or exposure to cold and moisture while under the influence of mercury.

Sometimes also a morbid condition of the system occurs during a mercurial course, and which tends to a fatal issue. Mr. Pearson has termed it erethismus. It is characterized by a great depression of strength; a sense of anxiety about the præcordia; frequent sighing; trembling, partial or universal; a small, quick pulse; sometimes vomiting; a pale contracted countenance; a sense of coldness; while the tongue is seldom furred, or the vital or natural functions much disordered. In this state, a violent or sudden exertion of muscular power will sometimes prove fatal.

To prevent dangerous consequences the administration of mercury must be immediately suspended, and the patient exposed to a dry, cool air, in such a manner as shall be attended with the least fatigue. An incipient erethismus has often been averted or cured by large doses of the volatile alkali, and by the camphor mixture.

Dr. Frances expresses an opinion that the modus operandi of mercury remains a question far from being decided. He adopts the opinion, however, that in a state of an oxide it is one of the most universal stimulants, acting on the nervous system, producing restlessness, anxiety, and debility. On the sanguiferous system, disposing the blood to take on the buffy coat, rendering the pulse frequent and harder, increasing respiration, and occasioning other symptoms of inflammatory action. It affects the secretions, inducing a preternatural flow of saliva, an increased action of the mucous vessels of the trachea, lungs, digestive organs, chylopoietick viscera and whole intestinal canal. It excites a copious discharge of urine; and in the smallest quantity operates with great certainty on the skin, and produces increased action of the absorbent vessels. It is therefore on its very general and stimulant operation in promoting the *excretions of the whole system*, depends its curative action. For the same salutary effects will not be produced when its action is not thus extensive, as when confined to the salivary glands, or exerts its influence on the intestinal canal alone.

For more than half a century the mercurial practice in the treatment of inflammatory and other febrile diseases,

has been prevalent among some physicians in New England ; and in pneumonia, pleurisies, acute rheumatisms, and other phlegmasiæ, it has been considered a remedy of superiour efficacy. About the year 1735 a malignant ulcerous sore throat became epidemical in the vicinity of Boston, and New York, &c. which having baffled the skill of physicians, at length yielded in a surprising manner to the administration of calomel. Subsequently to this event, the employment of mercury has been extended to the various forms of malignant, pestilential, or yellow fever of the West Indies, and to the intermitting, remitting, and typhus fevers which have ravaged some of the cities of the United States. Various opinions and much controversy have subsisted in the medical world respecting this subject. Dr. F. has now given to it a zealous investigation. To Dr. Chisholm he ascribes exclusively the credit of being the first who adopted the novel practice of exhibiting mercury to the full extent; having given calomel to the amount of four hundred grains, and at a subsequent season no less than eight hundred, and at other times upwards of one thousand grains were employed. Nay farther ! in one instance of yellow remitting fever, before any very material change took place in the state of the patient, he had taken, says Dr. C. sixty-four grains of calomel by the mouth, thirty-four drachms by clyster, and sixteen ounces of the strongest mercurial ointment carefully rubbed into his arms and thighs ; in all five thousand seven hundred and four grains in the course of five days. His recovery was astonishingly rapid after the change was effected.

If it be conceded that the mercurial practice to a greater or less extent in the hands of Dr. Chisholm, Dr. Wright, and other eminently distinguished physicians in the West Indies, was crowned with success, exceeding that of any other method, yet the utility of a similar mode of treatment, in the diseases of the same type in the United States, is deemed problematical. This more appropriate point receives an able discussion by our author. The climate of this country, he says, is singularly unfavourable to the salutary operation of this medicine. While the liver appears to be the most diseased organ in those who die of yellow fever in the West Indies, this important viscus seems to be in a remarkable degree exempt from derangement, in the same disease in our country, as proved by numerous dissections. The very nature and seat of the

disease establish the fact, that, the brain and nervous system are primarily affected, the stomach and duodenum exhibit marks of high inflammation, and approaching sphacelus, attended by acute pain in the gastrick region, and extreme irritability of the stomach. These symptoms, instead of being removed by the use of calomel, are greatly aggravated, and excessive vomiting is induced, which terminates but with the life of the patient.

In the more advanced stage of yellow fever, when the most formidable symptoms have occurred, the great prostration of strength forbids the recourse to a medicine of such debilitating powers; the rapid termination sets at defiance the slow accomplishment of salivation. Whether therefore, with a view of its action on the salivary glands or otherwise, the indiscriminate employment of mercury in the treatment of yellow fever, or the various forms of intermitting or remitting fever of our country, is according to Dr. F. to be considered as an abuse of the medicine, and altogether inadmissible.

With regard to the employment of mercury as a remedy in syphilis, Dr. F. accords in opinion with other writers as to its almost infallible powers; with much propriety, however, he animadverts on the mal administration of it, as producing more destructive consequences than the disease itself. He is most decidedly opposed to the popular method of treatment by a profuse salivation, induced by throwing into the system large quantities of mercury: no absurdity in medical practice having been destructive of more lives; none the source of more pain and calamity. A preternatural action from any one of the secretions is not to be depended on; mercury must be in a state of solution in the juices of the body. The specifick poison of lues venerea, must be counteracted by a general operation on the constitution, or more directly in promoting the action of all the secretory vessels of the body, and especially those of the surface. Equally opposed, therefore, to the opinion declared by Mr. Bell, that no advantage is derived from any increase that may be made to any of the secretions, and to that of Mr. Howard, who is the advocate for profuse salivation even in the mildest form of the disease, and who contends that the greater the discharge the more certain the cure; the most successful practice, he observes, depends upon an increased discharge from the *excretory vessels of the whole system.*

The preparation more peculiarly adapted to effectuate these several purposes is next to be selected. The *mu-*

rias hydrargyri, or the corrosive sublimate, is in his view by far the most eligible. The qualities of this and other forms of mercury will be particularly described under the head of preparations.

Mercury is frequently introduced into the system by means of inunction on the surface for the purpose of destroying or eleminating the venereal virus. In this form it may be applied to such extent as to excite full salivation, or so limited as only to induce a moderate degree of ptyalism. Instances may occur in which either the external or internal absorbents will not receive a sufficient quantity to produce the desired effect, either on the disease or the constitution ; and when exhibited internally it will very materially affect the functions of the stomach in despite of all our precautions. If therefore, on trial, the external application should not succeed, we are to resort to the internal administration ; and on the other hand, should this fail, the inunction must be substituted. (See unguentum hydrargyri.)

It has already been observed that quicksilver taken into the stomach in its native state is perfectly inert. It has been prescribed in the first stage of the iliack passion, before the bowels are too much weakened and corroded by the stagnant feces. There are instances in which several ounces, nay half a pound and upwards of pure quicksilver have been swallowed with the happiest effects, given with castor oil or fresh broth. But in the last stage of obstinate and violent colicks, when inflammation and gangrene have already taken place in the bowels, its specifick gravity would infallibly rend the intestines, and accelerate the fatal crisis.

The high importance of the above subject will, it is presumed, justify a reference to the opinions, and valuable observations of several writers of distinguished merit, collected into one view, and to be found in Cooper's Dictionary of Practical Surgery, under the words Mercury and Venereal disease.

Hyoscyamus Niger. *Black Henbane.* The herb and seeds.

Henbane is a biennial plant, which abounds in villages, road-sides, and among rubbish ; and flowers in July. The whole plant is covered with long hairs, from which exudes a clammy fœtid juice. The leaves are large and very

soft; they are indented and embrace the stalk closely. The flowers come out in a very long spike, rather on one side, and sit close to the stalk. The corolla is funnel shaped and obtuse, of a pale yellowish colour, beautifully veined with purple.

The leaves of this plant, when recent, have a slightly fœtid smell; and a mucilaginous taste; when dried, they lose both taste and smell, and also part of their narcotick power. The root possesses the same qualities as the leaves, and even in a more eminent degree. Henbane, more than any other narcotick, resembles opium in its action. In a moderate dose, it increases at first the strength of the pulse, and occasions some sense of heat, which is followed by diminished sensibility and motion; in some cases, by thirst, sickness, stupor, and dimness of vision. In a larger quantity it occasions profound sleep, hard pulse, and sometimes fierce delirium, ending in coma or convulsions, with a remarkable dilatation of the pupil, distortion of the countenance, a weak, tremulous pulse, and eruption of petechiæ. On dissection, gangrenous spots have been found on the internal surface of the stomach. Its baneful effects are best counteracted by a powerful emetick; and, after discharging the contents of the stomach, it will be necessary to administer emollient and oily clysters, and repeat them as often as they are ejected; and to drink as large portions of vinegar and of the juice of lemons as the stomach will support.

Henbane has been used in various spasmodick and painful diseases; as in epilepsy, hysteria, palpitation, headache, paralysis, mania, and scirrhus. It is given in the form of the inspissated juice of the fresh leaves, the dose of which is from one to two grains, which ought to be gradually increased. It is sometimes employed as a substitute for opium, where the latter, from idiosyncrasy, occasions any disagreeble symptoms. The henbane is also free from the constipating quality of the opium; and like this last also, its influence is very much diminished by habit. In open ulcers, the powder of the leaves, sprinkled on the part, has often a good effect.

Hyssopus Officinalis. *Hyssop.* The herb.

The leaves of hyssop have an aromatick smell, and a warm pungent taste; they are particularly recommended in humoral asthmas, coughs, and other disorders of the

breast and lungs; being supposed wonderfully to promote expectoration. According to Ray, these leaves are of great service when applied in cataplasms to bruises, the pain of which they speedily mitigate, and at the same time disperse every mark or spot from the part affected.

IETODES FŒTIDUS. *Skunk Cabbage.* The root.

In the preceding editions of this work, this singular vegetable was inserted under the names Pothos Fœtida and Dracontium Fœtidum, but the present name is substituted by the authority of professor Bigelow (Med. Botany.) This plant abounds in swamps and low meadows throughout the middle and New England states. The vulgar name by which it is known is derived from its very rank and disagreeable smell, resembling that of a skunk, and from its large bunches of leaves, resembling the cabbage. This plant has no stem; and the first part that appears above ground, in April and May, is the hollow boat shaped spathe, open on one side, and bellied out on the opposite, beautifully spotted with red and yellow, with its acute top somewhat twisted. The leaves next appear at a small distance from the flower stalk, in a conick form, very closely rolled together, expanding nearly ovate as they rise, supported on foot stalks. Within the spathe is the large globe of variegated flowers, and the receptacle incloses many large round seeds. The roots and seeds, when fresh, impart to the mouth a sensation of pungency and acrimony similar to arum.

The medicinal properties of this valuable plant were first announced by Rev. Dr. Cutler, by whose authority, corroborated by the experience of medical correspondents, it has been introduced into the former editions of this work, as a new article of the materia medica. It may be ranked high as an antispasmodick, experience having evinced that it is not inferiour in efficacy to the most esteemed remedies of that class. In cases of asthmatick affections, it alleviates the most distressing symptoms, and shortens the duration of the paroxysms. It should be exhibited during the paroxysm, and repeated as circumstances may require. It will be proper to persevere in the use of it for some time after the paroxysm has gone off, or till the patient is perfectly recovered, which is said to have been the method pursued by the Indians for the cure of this disease. Rev. Dr. Cutler

experienced in his own particular case very considerable relief from this medicine, after others had disappointed his expectations. In obstinate hysterick affections, this medicine has surpassed in efficacy all those antispasmodicks which have been generally employed, and in several instances it has displayed its powers like a charm. In one of the most violent hysterick cases I ever met with, says a correspondent, where the usual antispasmodicks, and even musk had failed, two tea spoonfuls of the powdered root procured immediate relief; and on repeating the trials with the same patient, it afforded more lasting benefit than any other medicine.

Other examples of hysteria and convulsions, in their most singular and aggravated forms, successfully treated by the skunk cabbage, are particularly detailed in the American Modern Practice, p. 530 531. In those spasmodick affections of the abdominal muscles, during parturition, or after delivery, this root has proved an effectual remedy. In chronick rheumatism, and erratick pains of a spasmodick nature, it often performs a cure, or affords essential relief. It has in some instances of epilepsy suspended the fits, and greatly alleviated the symptoms. In hooping cough, and other pulmonick affections, it proves beneficial in the form of oxymel, or syrup, in the same manner as squills. During every stage of nervous and hysterick complaints, and in cramps and spasms, this medicine is strongly recommended as a valuable substitute for the various antispasmodick remedies commonly employed. It is free from the heating and constipating qualities of opium, and the great expense of musk. Having in a few instances tested its virtues in subsultus tendinum, attending typhus fever, its pleasing effects will encourage the future employment of it in similar cases. Two instances have been related in which this medicine has been supposed to be remarkably efficacious in the cure of dropsy, two tea spoonfuls of the powdered root being taken every morning successively, till the cure was effected. The proper dose of the dried root in powder, is half a drachm, thrice in a day, or of a strong infusion, a wine glass full, every three or four hours. The seeds of this plant are said by some to afford more relief in asthmatick cases than the root. A caution is suggested by Dr. Cutler, that in collecting the roots, the *swamp hellebore*, or *poke root*, which some people call skunk weed, be not mistaken for this plant, as the con-

sequences might be fatal. There is an obvious distinction; the hellebore has a stalk, but the skunk cabbage has none; and the roots and leaves of the latter are much larger than those of the former. The roots should be taken up in the autumn or spring, before the leaves appear, and carefully dried for use. Its strength is impaired by long keeping, especially in a powdered state.

INULA HELENIUM. *Elecampane.* The root.

This is a very large downy perennial plant, sometimes found wild in moist rich soils. The root, especially when dry, has an agreeable aromatick smell; its taste, on first chewing, is glutinous and somewhat rancid, quickly succeeded by an aromatick bitterness and pungency. The ancients entertained a high opinion of elecampane, which is recommended for promoting expectoration in humoral asthma and coughs; liberally taken, it is said to excite urine, and loosen the belly.

In some parts of Germany, large quantities of this root are candied, and used as a stomachick, for strengthening the tone of the viscera in general, and for attenuating viscid humours. Its dose is from twenty to sixty grains powdered; and in this form it has been found, by experience, to possess considerable efficacy.

IPECACUANHA. *Ipecacuan.* A root, either of the cephælis ipecacuanha, or psychotria emetica.

The root of ipecacuan is brought from Spanish America. It is divided into two sorts, Peruvian and Brazilian; the eye distinguishes three, ash coloured or gray, brown, and white. The ash coloured or Peruvian ipecacuan of the shops, is a small wrinkled root, bent and contorted into a great variety of figures; it has very little smell; the taste is bitterish and subacrid, covering the tongue with a kind of mucilage. The brown sort has been sometimes observed, even in a small dose, to produce violent effects. The white, though taken in a large one, has scarce any effect at all.

The first sort, the ash coloured or gray ipecacuan, is usually preferred for medicinal use. It contains both a a resinous and gummy matter. It is generally stated, that its emetick power, and, indeed its principal virtues, reside in the former, though Dr. Irving has affirmed that they

depend on its gum. Its active matter is completely extracted by alcohol, proof spirit, or wine. Vinegar likewise dissolves it, but at the same time greatly weakens its power. By decoction with water, its activity is greatly impaired, though the water distilled from it has scarcely any emetick power. It is even injured by being kept long exposed, in the state of powder, to the air and light.

Ipecacuan is the mildest of those emeticks, which are at the same time certain in their operation; and possesses this peculiar advantage, that, when it does not operate by vomiting, it passes off by the other emunctories. It merely evacuates the contents of the stomach, without exciting violent vomiting, or extending its action beyond the stomach; and is hence adapted to many cases where violent vomiting would be useless or improper. The medium dose of it as an emetick is fifteen grains, though twenty or thirty may be taken with perfect safety. Ipecacuan is employed with other intentions than as an emetick. It was at one time much celebrated as a remedy in dysentery, given either in such a dose as to produce full vomiting, or rather in the quantity of two or three grains, repeated every three or four hours, till it occasioned vomiting, diaphoresis, or purging. It has been given in a similar mode in obstinate diarrhœa. In spasmodick asthma, it is given in a full dose to relieve the paroxysm; and in a dose of three or four grains, continued every morning for some weeks, to prevent the return of the disease. In hæmorrhagies, it is given in nauseating doses, the nausea diminishing the force of the circulation. Combined with opium, it forms a very powerful sudorifick.

The primary effect of ipecacuan, says Dr. Duncan, is that of stimulating the stomach. If the dose be sufficiently large, it excites vomiting, by inverting the peristaltick motion of the stomach and duodenum; in a smaller dose, it only produces nausea, and operates by stool; and in still smaller doses, it gently stimulates the stomach, increases the appetite, and facilitates digestion. Its secondary effects depend on the sympathy of the other parts with the stomach; and in this way only can we explain its action as an antispasmodick, diaphoretick, expectorant, and in checking hæmorrhagies.

Its beneficial effects, in some cases, also, seem to be owing to the general concussion given to the whole system during the action of vomiting. It is found to increase

the purgative virtue of jalap remarkably. Dr. Aiken asserts that fifteen grains of jalap, with two or three of ipecacuan, purge more than twice the quantity of jalap by itself.

Ipecacuan properly administered, often proves serviceable,

1. In intermittent fevers. It has frequently succeeded in stopping these, when given about an hour before an accession was expected, and also when given so as to produce vomiting at the time of an accession, or at the end of the cold stage.

2. In continued fevers. We have never seen more decidedly beneficial effects from the use of any medicine whatever, than from the exhibition of ipecacuan in the commencement of typhus fever. An emetick, succeeded by a diaphoretick regimen, when administered sufficiently early in this disease, very frequently cuts it short at once; and when it fails in this desirable object, it always has a beneficial influence on the progress of the fever.

3. In inflammatory diseases, rheumatism, bubo, swelled testicle.

4. In exanthematous diseases, when the eruption is disposed to recede.

5. In hæmorrhagies, when given in nauseating doses.

6. In profluvia, especially in dysentery, so much so, that it was formerly esteemed a specifick against that disease. But Cullen attributes its good effects in this instance, to its producing a steady determination of the peristaltick motion of the intestines downwards, when given in repeated small doses.

7. In many spasmodick diseases; in epilepsy; asthma; dyspnœa; pertussis; chronick diarrhœa; hysteria; melancholia; mania.

8. In cachectick diseases, as in some kinds of dropsy.

9. In impetiginous diseases; in jaundice.

10. In local diseases; in amaurosis, and several of the dysorexiæ.

11. In every instance when we wish to evacuate the stomach, as when it is overloaded with food, or when poison, especially opium, has been swallowed.

The use of ipecacuan, as an emetick, is contra-indicated,

1. Where there is a disposition to hæmorrhage.

2. Where there is an increased flow of blood toward the head.

3. In very irritable subjects.

4. In pregnant women, and persons afflicted with hernia.

Ipecacuan is exhibited,

1. In substance; in powder. Full vomiting will generally be produced in an adult by a scruple or half a drachm; and though less might answer the purpose, fortunately an over dose is scarcely attended with any inconvenience, as the whole of it is vomited with the contents of the stomach as soon as it operates. The vomiting is promoted and facilitated by drinking copiously of warm watery fluids. On the contrary, when vomiting is not intended, liquids must be rather drunk sparingly, and the dose must be diminished to a grain or less. In such small doses it is conveniently combined with any proper adjunct, in the form of powder, pill, or bolus.

2. In infusion. One drachm may be infused in four ounces of water, and taken in repeated doses till it operate.

3. Infused in wine. (See vinum ipecacuanhæ.)

Ipecacuan not only checks the narcotick effects of opium, and is therefore one of the best antidotes for its poison, but reciprocally the emetick powers of ipecacuan are checked by the addition of opium, and the combination operates by increasing the cuticlar discharge. (See pulvis ipecacuanhæ et opii.)

It has recently been announced by Thomas Clark, M. D. an English physician, that a decoction of the root of ipecacuanha has been administered as injections in dysentery and internal piles with surprising success. The practice has been adopted by several physicians, all of whom testify their confidence in the superiour efficacy of the remedy. Dr. Clark directs for an adult affected with dysentery three drachms of the bruised root to be boiled in a quart of water down to a pint, strained, and given all at once as a lavement, and repeated if necessary. In cases of internal piles, half that quantity will be sufficient.

IRIS VERSICOLOR. *Blue flag, or Flower de luce.* The root.

This beautiful plant, in the last edition of this work, called Iris Virginica, is now termed in professor Bigelow's Medical Botany, Iris Versicolor. "It is found through-

out the United States in the borders of swamps, and in wet meadows, of which it forms a principal ornament in the month of June." The root is fleshy, horizontal, sending down a multitude of fibres. Stem two or three feet high, round on one side, acute on the other, frequently branched, and bearing from two to six flowers. Leaves sword shaped, striated, sheathing at base. The root of this plant is an active cathartick, in doses of a few grains in its recent state, or when dried, though Dr. Bigelow asserts it is apt to occasion a distressing nausea, like sea sickness, with a prostration of strength of some hours continuance. Its activity is diminished by age. This root possesses also the properties of a diuretick, and administered in moderate doses, in the form of decoction or tincture, it has proved efficacious in anasarca and other dropsical affections. We have several species or varieties of iris in our swamps and meadows, whose medical properties have not been well ascertained. The roots of some are more acrid than others, and some it is said do not lose their purgative quality by drying, but in a dose of a table spoonful of the powdered root act as an active cathartick, and prove an efficacious remedy in dysentery. It must be left to experimental trials to ascertain their real virtues, and which variety possesses the most medical properties.

The root of the European species (iris pseudacorus) has an acrid taste, and when fresh is strongly cathartick. The expressed juice of the recent root in doses of sixty or eighty drops every hour or two, and occasionally increased, has been productive of very copious evacuations. after jalap, gamboge, and other strong purgatives had proved ineffectual.

JUGLANS CINEREA. *Butternut. White Walnut.* The unripe fruit, and the inner bark.

This tree is generally known throughout the United States, and is now introduced into the materia medica of the national pharmacopœia. During the American war, the extract, made from the inner bark of this tree, attracted the attention of Dr. Rush, and other medical men in our military hospital; and, being frequently administered to patients under the operation of inoculated small pox, it was proved to be an excellent substitute for jalap or other catharticks. It is now esteemed as a valuable purgative, in doses from ten to thirty grains, not

occasioning heat or irritation; and is greatly commended in cases of dysentery. Conjoined with calomel it is rendered more active and efficacious, especially in bilious habits. In cases of habitual costiveness the extract of butternut is to be preferred to most other cathartick, as it leaves the bowels in a good state. As this extract is often very carelessly prepared by the country people, it ought to be prepared by the apothecaries, or practitioners themselves; and as a domestick medicine of considerable importance, it should be adopted by every physician. The bark of the root of this tree will excite a blister; and the bark and shells of the nuts dye a good brown colour. A decoction of the inner bark is advantageously employed as a cathartick in the disease of horses, called the *yellow water*. The extract should be made from the bark in the month of May or June. The bark of butternut is known to be the basis of the bilious cordial sold in the shops.

Juniperus Communis. *Juniper*. The berries and leaves.

This is an evergreen shrub growing on dry barren commons and hilly grounds in different parts of the United States as in Europe. If planted in a good soil it will attain the height of fifteen or sixteen feet, and produce numerous branches. It is remarkable that no grass will grow beneath this shrub. This tree has three spreading pointed leaves coming out together, that are longer than the berry. The wood is of a reddish colour, very hard and durable. Gum sandarach, more commonly called pounce, is the product of this tree. The flowers are borne upon a conical catkin, the scales of which serve the purpose of a calyx. The berries of the juniper require two years before they ripen, when they change from a green, or a blackish purple, to a bluish black colour. Juniper berries possess a strong not disagreeable smell, and a warm pungent sweet taste, which if they be long chewed, or previously bruised, is followed by a bitterish one.

Their predominant constituents are, an essential oil, and a sweet mucilaginous matter. To the oil, they are indebted for their stimulating, carminative, diaphoretick, and diuretick properties.

They are most commonly used in the form of infusion, to which a little gin is added, as a diuretick drink in dropsy. The essential oil may be separated by distillation.

It possesses the same properties in a higher degree, and imparts them to ardent spirits.

The peculiar flavour, and well-known diuretick effects of Holland gin, are owing to the oil of juniper.

JUNIPERUS SABINA. *Savine.* The leaves.

The savine is also an evergreen shrub, spreading out much horizontally, rising but little in height. The leaves are small, opposite, running down the stalk, and rather prickly. It produces blue berries, only after it has arrived at a considerable age. The wood is internally of a beautiful reddish shade, resembling that of mahogany. The leaves of savine possess a bitter, acrid taste; and their smell is so powerful and disagreeable, that it expels moths and similar vermin. When distilled with water, these leaves yield an uncommonly large proportion of essential oil.

Savine is a warm, stimulating medicine, capable of producing diaphoresis, and increasing all the secretions, but apt to excite hæmorrhage, especially from the uterus. It has long been considered as a powerful emmenagogue; and Dr. Home asserts, that in five cases of obstructions of the menses, four were cured by the savine, which he gave in powder, from a scruple to a drachm, twice in a day. But this acrid and heating substance, in the opinion of Dr. Cullen, is improper in plethorick habits, and should be employed with caution in those cases only which proceed from a relaxed state of the solids.

The oil distilled from this shrub is one of the most violent emmenagogues, and ought therefore to be used with the greatest caution in obstructions of the uterus or other viscera, proceeding from laxity or weakness. Savine is also recommended as an anthelmintick, and said to be very efficient in the cure of the gout.

The learned professor Chapman, of Philadelphia, has recently introduced savine as an efficacious remedy in chronick rheumatism, and considers it entitled to be placed at the very head of the remedies in that disease. From his extensive experience he considers this medicine as a warm, powerful, and diffusible stimulant, exciting all the secretions with a considerable determination to the surface. In that form of chronick rheumatism in which there exists great exhaustion of the system, with an unusual degree of coldness, and want of action on the surface of the

body, the professor has administered the powder of savine internally with the happiest effects. "The influence of the savine he observes over the circulation is prodigious. The pulse, which, previously to its exhibition, is commonly small, weak, and accelerated, now becomes full, active, and comparatively slow. No portion of the system, indeed, seems to escape its wide pervading operation; every function being more or less invigorated, and especially some of the secretory offices, as the urinary, the catamenial, and, perhaps, the seminal." "Encouraged by his successful use of savine in one kind of chronick rheumatism, Dr. Chapman was led to administer it in another; that which is usually denominated syphilitick. Here, again, his success was highly flattering; the disease being always alleviated, if not cured by the remedy. On commencing the use of savine, in any case, the professor's practice is to administer to an adult from twelve to fifteen grains of the powdered leaves, three times a day. This dose he gradually increases, until an evident effect is produced; which, sometimes, as he informs us, requires three or four times the quantity with which he had begun."—*New England Med. Jour. vol.* 6, *p.* 188.

Externally, the leaves are applied in the form of powder or infusion, to warts, carious bones, and old ulcers; and in cases of psora, gangrene, and tinea. Farriers apply this article with success to the ulcers of horses. Equal parts of powered savine and verdegris, will effectually remove warts and other excrescences from the skin; and the same preparation, when applied to issues, will greatly promote their discharge.

JUNIPERUS VIRGINIANA. *Common Red Cedar Tree.* The leaves.

The red cedar tree is a native of the United States, and grows to the height of fifteen or twenty feet. Its berries are smaller than those of the true juniper. In Virginia and Carolina the berries are distilled into brandy. The leaves of this tree are now brought into notice by the investigation of Dr. Aaron Dexter, professor of chemistry, and materia medica, in the university at Cambridge. He has found this to be the only species of juniper in the United States, whose leaves agree in their properties with those of the savine, directed by Dr. Crowther, as the basis of the savine ointment.

KALMIA LATIFOLIA. *Broad leafed Laurel. Winter green. Callico tree.*

This is the largest of the several species of kalmia, growing to the height of seven or eight feet, in swamps and moist rocky pastures. Blossoms are white, tinged with red, in June and July. The wood is hard and compact; and the Indians are said to have made small dishes, spoons, and other utensils out of the roots; they are said also to have used a decoction of this plant to destroy themselves. The leaves are highly poisonous to horses; but deer and pheasants eat them with impunity; though the flesh of these birds was once rendered poisonous by eating the leaves or berries late in the winter, and occasioned the death of some persons who ate of their flesh.

The other species, *kalmia angustifolia*, narrow-leaved, or dwarf laurel; called also *ivy*. *Lambkill* is an evergreen common in cold wet land. Blossoms, reddish variegated. June and July. The leaves prove fatal to sheep. From an experimental inaugural dissertation published in Philadelphia, in 1802, by Dr. Thomas, upon the above species of kalmia, it appears that the leaves of both abound with resin, but that the last is the most active of the two.

From the same dissertation we find, that a decoction of the *K. latifolia*, prepared by putting one ounce of the leaves in eight ounces of water, and boiling it down to four ounces, cured a *diarrhœa* of eight weeks continuance. The dose at first was thirty drops six times a day, but producing vertigo, it was diminished to four times a day. The itch was speedily cured by washing the parts with the decoction. The scald head, *tinea capitis*, was also cured by anointing the head with an ointment made of the leaves and hogs lard. Dr. Barton bears testimony of the efficacy of this ointment in the tinea. A saturated tincture of the leaves of this plant in proof spirit is an active remedy. Some kinds of *herpes* and warty excrescences have been known to yield to the repeated application of an infusion of kalmia leaves.

Dr. Bigelow in his medical botany, observes of the kalmia latifolia, that he has repeatedly chewed and swallowed a green leaf of the largest size, without perceiving the least effect in consequence. He has also seen the powder, freshly made from leaves recently dried, taken

in doses of from ten to twenty grains, without any subsequent inconvenience or perceptible effect.

Kino. *Kino.*

The substance distinguished by this name was introduced a number of years ago into the materia medica as a powerful astringent, little being known with regard to its origin, farther than it was said to be the produce of Africa, and obtained probably from the plant affording it by exudation. Subsequent to its introduction, it was met with in the shops very various in its qualities; it still is so, and is obviously of different origin, though there is considerable obscurity with regard to the natural history of these varieties. The London college have described it merely as the produce of an African plant unknown. The Edinburgh college have inserted it in their catalogue of simples, as the concrete juice of the eucalyptus resinifera, a tree a native of New Holland; and there is reason to believe that at least part of what is called kino in the shops, is imported from that country, and is the produce of this vegetable. The Dublin college have considered kino, as the product of the butea frondosa, on the authority of Roxburgh; but incorrectly, as Dr. Duncan has remarked. He has farther observed, what is perfectly just, that much of the kino of the shops bears all the appearance of an extract artificially prepared, and is known to be formed from different astringent vegetables. It is not very easy to discriminate exactly among these various substances, and to assign to each its real origin. One variety, and which bears the highest price in the shops, has all the appearance of a natural production: slender twigs are intermixed in its substance; it is of a reddish brown colour, with a resinous lustre, is very brittle, and has a bitterish astringent taste. This corresponds in its characters with the substance first introduced as kino, and is still said to be the produce of Africa, and to be imported from Senegal. The kind from New Holland has also the appearance of a natural production, fragments of bark being intermixed with it; it is in more solid masses than the other, is less brittle, and with its astringency has a disagreeable mawkish sweetish taste. The third kind, and which is most commonly met with, has the appearance of an extract thoroughly dried; it is in small fragments, with a resinous fracture, is of a brown

colour, more approaching to black than the others, and has a taste astringent and slightly bitter. This Dr. Duncan has stated, is said to be the produce of the coccoloba uvifera. I have also been informed, says Murray, that it is the extract of the wood of the mahogany.

The analysis of kino has been executed; but from the difficulty of ascertaining exactly to what substance the name is applied, there is a difficulty in appropriating the results to any of the varieties that are met with. All of them, however, appear to contain a large proportion of tannin; their solutions giving a deep colour, not purple, however, but green, with salts of iron, a copious precipitate with gelatin. The active matter of all, or the greater number of them, is soluble in water, with the assistance of heat, and is still more easily soluble in alcohol.

Kino has been employed as an astringent for the same purposes as catechu, and they are often given in combination. The catechu being more uniform in its qualities, ought perhaps to be preferred.

Kino is exhibited internally, in doses of from ten to thirty grains, in substance, or dissolved in diluted alcohol. It has been considered a powerful remedy in obstinate chronick diarrhœas and dysenteries; in all passive hæmorrhagies, especially from the uterus; in fluor albus; and in diseases arising from laxity of the solids.

Lactuca Sativa. *Common Garden Lettuce.* The plant.

This plant abounds with a milky juice which possesses all the characteristick properties of the opium of the shops, and may be procured from it in sufficient quantity, to repay any labour bestowed on it for this purpose. Laudanum made from the opium of the lettuce increases the pulse in force and frequency, and produces generally the same effects as result from similar doses of common laudanum. It has been used with advantage in allaying the pain of chronick rheumatism, and colick; in checking the frequent stools accompanying diarrhœa; in allaying cough, &c. &c. The venerable Dr. Andrew Duncan, senior, of Edinburgh, has published some valuable observations respecting the properties of a soporifick medicine prepared from the inspissated white juice of the common garden lettuce, called lettuce opium, but to which he has given the name of *lactucarium*. Upon this substance he has bestowed high encomiums as being a valuable sub-

stitute for Turkey opium. He affirms that of all the medicines which he has employed for alleviating cough in phthisis pulmonalis, and indeed as a sedative in many other diseases, next to opium, he has found no article so beneficial as lactuearium. It does not, like opium, occasion confusion of head, vertigo, irritation of the skin, sickness at stomach, vomiting, &c. nor does it induce a state of constipation. Dr. D. has been engaged in a series of trials for ascertaining more fully the medicinal effects of this preparation. He commenced his experiments upon that variety of lettuce which is commonly known among gardeners by the name of *ice lettuce*, but the particular variety is probably not essential. This juice, when inspissated by the heat of the sun on the wounded plant, soon assumes the dark colour of opium; which at the same time possesses in a high degree the peculiar, and it may be said specifick taste, which distinguishes that substance. For obtaining the lactuearium Dr. D. directs the following process. When the plant has risen to about a foot above the surface of the earth, it must be cut off about one inch from the top of the stem. The milky juice immediately begins to rise, and soon after forms a dark coloured incrustation over the wounded surface. As this cannot be separated by scraping, it is necessary to cut off a thin cross slice of the stem, to which the whole of the opium-like matter adheres. This operation may be several times repeated upon the same plant, putting the slices into a wide mouth phial with diluted alcohol until the spirit become fully saturated with the inspissated juice. This spirituous solution being strained off, has nearly both the appearance and taste of the ordinary laudanum of the shops. But to obtain a form in which it may be exhibited with greater certainty as to the dose, the spirituous solution should be evaporated, and thus brought to a state of dry extract; and this is the lactuearium of Dr. Duncan. From the lactuearium thus obtained may be formed a tincture, by dissolving it in diluted alcohol in the same proportion as in the liquid laudanum of the dispensatory. This *tinctura lactuearii* is an eligible formula containing the soporifick and sedative powers of the lactuca sativa, and is little inferiour, in its medicinal effects, to laudanum prepared from foreign opium. The two following preparations may be obtained at a very trifling expense, and though not so powerful as the foregoing will be found highly useful in practice.

Take any quantity of the leaves and stalks of lettuce when the the plant is nearly ready to flower. Bruise them well, and including them in hempen bags, compress them strongly till they yield their juice. Let this juice be evaporated in flat vessels heated with boiling water, till reduced to the consistence of thick honey. This may be given in the form of pills from one to three or four grains. Twelve pounds of lettuce will yield about eight ounces of inspissated juice.

Take of the dried leaves and stalks of lettuce one ounce, diluted alcohol eight ounces. Let the vessel be kept for a week in a warm place, shaking it frequently, then strain the tincture through paper for use. Dose about fifty drops.

A preferable method of collecting the milky juice, instead of suffering it to form a crust on the wounded stem, is to absorb it with a wet sponge as it exudes on the surface, and is in a liquid state. The juice thus collected being expressed from the sponge, into a suitable cup, soon acquires a dark brown colour, like opium, and has all its other sensible qualities. It should be observed that the lactuearium, obtained from our common lettuce, has in several trials failed of producing the full narcotick effect, and disappointed the expectations excited by the venerable author.

LACTUCA VIROSA. *Wild or Strong-scented Milk-weed. Lettuce.* The leaves.

This plant is perennial, growing spontaneously on rubbish and beside fences, and flowering in August and September. The stem rises to three or four feet, and is prickly on its lower end. All the leaves are horizontal and greatly indented; they are arrow shaped, and their mid-rib prickly on the back part. Flowering branches expanding, floral leaves similar to the stem leaves, but smaller. Blossoms numerous on short fruit stalks, yellow, opening about seven, and closing about ten in the forenoon.

This plant affords a large quantity of milky juice which smells like opium, and is acrid and bitter. It resembles opium in some of its effects; its narcotick power like that of the poppy head resides in its milky juice. An extract prepared from the expressed juice of the leaves of this plant, gathered when in flower, is recommended in

small doses in dropsy. In dropsies of long standing, proceeding from visceral obstructions, it has been given to the extent of half an ounce in a day.

It is said to agree with the stomach, to quench thirst, to be gently laxative, powerfully diuretick, and somewhat diaphoretick. Plentiful dilution is allowed during its operation. Dr. Collin, of Vienna, asserts, that out of twenty-four dropsical patients, all but one were cured by this medicine. This acrid narcotick should be prescribed with some precaution, commencing with about three grains four times a day, increasing gradually. It is said to be an excellent antispasmodick, quieting the convulsive efforts in pertussis, and relieving suffocating dyspnœa of hydrothorax.

LAURUS CINNAMOMUM. *The Cinnamon Tree.* The bark, and its volatile oil.

This valuable tree is a native of Ceylon, in the East Indies, and is now cultivated in Jamaica and other West India islands. It grows from four to ten feet high, and is very bushy. The leaves resemble those of the laurel, and have the hot taste and smell of cloves when chewed. Cinnamon is the interiour bark of the tree; it is thin and convoluted, of a texture somewhat fibrous, of a slight brown colour, having an agreeable pungent taste, with a degree of sweetness and an aromatick flavour. Its virtues chiefly depend on the small quantity of essential oil which it contains. This bark is a very useful and elegant aromatick, more grateful both to the palate and stomach than most other substances of this class. Like other aromaticks, the effects of cinnamon are stimulating, heating, stomachick, carminative, and tonick; but it is rather used as an adjunct to other remedies, than as a remedy itself.

The essential oil of cinnamon has a whitish yellow colour, a pungent burning taste, and the peculiar fine flavour of cinnamon in a very great degree. It should sink in water, and be entirely soluble in alcohol. It is principally prepared in Ceylon. This oil is one of the most powerful stimulants we possess, and is sometimes used as a cordial in cramps of the stomach, and in syncope; or as a stimulant in paralysis of the tongue, or to deaden the nerve in toothache. But it is principally used as an aromatick, to cover the less agreeable taste of other drugs.

Laurus Cassia. *The Cassia Tree.* The bark and flower buds, gathered before they open.

This tree is very similar to the former. The bark, which is imported from different parts of the East Indies and from China, has a very exact resemblance to the cinnamon. It is distinguishable from the cinnamon, by being of a thicker and coarse texture, and by its breaking short and smooth, while the cinnamon breaks fibrous and shivery.

It resembles cinnamon still more exactly in its aromatick flavour and pungency than in its external appearance, and seems only to differ from it in being considerably weaker, and in abounding more with a mucilaginous matter.

Cassia buds are the flower buds which are gathered and dried before they expand. They are of a brown colour; their taste and flavour is similar to the bark, and they are used for the same purposes.

Both the bark and buds of cassia possess the same properties with cinnamon, though in an inferiour degree. The bark is very frequently, and sometimes unintentionally, substituted for the more expensive cinnamon; and the products obtained from cassia bark and buds by distillation, are in no respect inferiour to those prepared from cinnamon.

Laurus Camphora. *Camphor Tree.* The Camphor.

The camphor laurel grows in great abundance, and to a very considerable size, in the forests of Japan. It is not uncommon in green houses in England.

Camphor is a proximate principle of vegetables, contained in many plants, especially those of the aromatick kind. For the purposes of commerce, it is obtained from the laurus camphora. It exists in distinct grains in the wood of the root and branches of this tree. It is extracted by sublimation; in Europe it is purified by a second sublimation, with the addition of one twentieth of its weight of lime.

Pure camphor is colourless, semitransparent, tenacious, and somewhat unctuous to the touch; its smell is strong and fragrant; its taste pungent and bitter. It is volatile at every natural temperature; is fusible in a heat inferiour to 212°; is inflammable; scarcely soluble in water, but

entirely soluble in alcohol, ether, and oils, essential or expressed. It consists of carbon and hydrogen, and differs from the essential oils, in containing a larger proportion of carbon, with some oxygen. By combustion it affords carbonick and camphorick acids.

In a moderate dose, camphor produces effects similar to those of other narcoticks. Its stimulant operation, however, is not considerable, even in a small dose; and in a large dose, it always diminishes the force of the circulation; induces sleep, and sometimes causes delirium, vertigo, and convulsions, ending in total insensibility. These violent effects of camphor are most effectually counteracted by opium. In a morbid state of the body, camphor allays inordinate actions. When the pulse is hard and contracted, it renders it fuller and softer.

It removes spasms and flitting pains arising from spasms; and in delirium, when opium fails of producing sleep, camphor will often succeed.

The most general indication for the use of camphor, is the languor or oppression of the vis vitæ.

It may therefore be given with advantage,

1. In all febrile diseases of the typhoid type, especially when attended with delirium.

2. In inflammations with typhoid fever, as in some cases of peripneumonia and rheumatism.

3. In eruptive diseases, to favour the eruption, or to bring it back to the skin, if from any cause it has receded, as in small pox, measles, &c.

4. In many spasmodick diseases, especially mania, melancholy, epilepsy, hysteria, chorea, hiccough, &c.

5. In indolent local inflammations, not depending on an internal cause, to excite action in the part.

As a stimulant, says Murray, camphor has been used in typhus, cynanche maligna, confluent small pox, and other febrile affections accompanied with debility, in retrocedent gout, and to check the progress of gangrene. As a sedative it is used in affections of an opposite nature, as in pneumonia, rheumatism, and gonorrhœa, combined with nitre or antimonials, or by itself, where evacuations have been made. In mania, it has sometimes succeeded as an anodyne: as an antispasmodick, it has been employed with advantage in asthma, chorea, and epilepsy.

The dose of camphor is from five to twenty grains. It cannot be given with safety in a larger dose than half a drachm; and Dr. Cullen has likewise remarked, that in too small a dose, as that of a few grains, it has very little

effect. In divided doses, it may be given to the extent of a drachm or more in the day. Its power of checking the progress of gangrene is promoted by combination with musk, or carbonate of ammonia: combined with opium, it forms a powerful diaphoretick; and its efficacy in inflammatory diseases is augmented by antimonials.

Camphor ought generally to be given in a state of mixture in some fluid form, as being then less apt to excite nausea. It may be diffused in water by trituration with sugar, mucilage, or almonds. To reduce it previously to powder, a few drops of alcohol must be added. Magnesia, by being triturated with it, has the effect of dividing and rendering it smooth, and may be used for its suspension; a number of the gum-resins also act on it in such a manner, that, from their mixture, a soft uniform mass is formed, and this affords another mode of diffusing it in water. But it may be conveniently exhibited in milk, in which it is rendered soluble by trituration.

Externally, camphor is applied chiefly as a means of exciting the action of the absorbents, and thus dispersing many kinds of swellings, extravasations, indurations, &c. Hence it is a very common ingredient in liniments. It has also the property of rousing the action of the nerves, and quickening the circulation, in parts on which it is rubbed. For this reason, in paralytick affections it is sometimes employed. As an anodyne in rheumatick and muscular pains, and as a discutient in bruises; and inflammatory affections, it is dissolved in alcohol or expressed oil, and applied by friction to the part. Perhaps there is no composition, that has greater power in exciting the absorption of any tumour or hardness, than camphorated mercurial ointment. Added to collyria, or mixed with lard, it is of service in ophthalmia. Suspended in oil, it is used as an injection in ardor urinæ, and as an enema to relieve the uneasy sensations occasioned by ascarides. The combination of it with opium is useful as a local application in toothache.

Camphor is recommended as singularly efficacious in cases of *ardor urinæ*, or scalding of the urine, and nervous headaches. One of the most eligible forms in which camphor can be given, is, to rub about eighty grains in a mortar, with six or eight grains of myrrh, having previously dropped a few drops of spirits of wine in the camphor; then add ten or fifteen grains of gum arabick, and gradually as much water as will suspend the whole.

Laurus Sassafras. *Sassafras.* The bark and volatile oil.

The sassafras tree was formerly celebrated for its medicinal virtues, and it has long retained a place in European pharmacopœias. Hoffman frequently employed an extract from the bark which he highly commended for strengthening the tone of the viscera in cachexies, and also in the decline of intermittent fevers, and in hypochondriacal affections. Professor Bigelow (Med. Botany) says, " The bark of this tree has a fragrant smell, and a very agreeable spicy taste. The flavour of the root is most powerful, that of the branches more pleasant. The flavour and odour reside in a volatile oil which is readily obtained from the bark by distillation. It is of a light colour, becoming darker by age, very pungent, and heavier than water. The bark and pith of the young twigs abound with a pure and delicate mucilage. A very small quantity of the pith infused in a glass of water gives to the whole a ropy consistence, like the white of an egg. The volatile oil and the mucilage appear to contain all the medicinal virtues of the tree, which are those of a warm stimulant and diaphoretick. The most proper mode of employing the sassafras is in the form of its volatile oil, which may be given in very small quantities as an antispasmodick, stimulant, and sudorifick. It is too acrid to be taken unmixed, and should therefore be dissolved in spirit, and mixed with water or syrup. The mucilage of the pith of this tree is peculiarly mild and lubricating, and has been used with much benefit in dysentery, and in catarrhal as well as calculous affections. Some eminent surgeons have employed it as a lotion in the most inflammatory stages of ophthalmia, to which its softness renders it extremely well suited.

Lavendula Spica. *Lavender.* The flowering spikes.

Lavender is a well known small, shrubby, perennial plant, a native of the south of Europe, but frequently cultivated in our gardens for the sake of its perfume. There are two varieties. The flowers of both have a fragrant, agreeable smell, and a warm, pungent, bitterish taste; the broad leaved sort is the strongest in both respects, and yields in distillation thrice as much essential

oil as the other; it is also hotter and specifically heavier; hence in the southern parts of France, where both kinds grow wild, this only is used for the distillation of what is called oil of spike. The narrow leaved, is the sort commonly met with in our gardens.

Lavender is considered as a warm stimulating aromatick. It is principally used as a perfume.

LEONTODON TARAXACUM. *Dandelion.* The root and leaves.

An indigenous, perennial plant, growing in meadows and pastures, on road sides, ditch banks, &c. It produces a yellow flower, which blows from April to September, and has the remarkable quality of expanding early in the morning, and closing in the evening. The root, leaves, and stalk, contain a large proportion of bitter milky juice, which possesses considerable activity. Its more immediate operation is, to remove visceral obstructions, and promote the urinary discharge: the dose prescribed by Boerhaave for this purpose, is four ounces, to be taken three or four times in a day; and later experience has corroborated its great efficacy in dropsical and other complaints connected with a disordered state of the first passages.

By modern writers dandelion is highly extolled in the treatment of chronick inflammation of the liver, or incipient scirrhus of that organ, and also in several chronick derangements of the stomach, in a dose of half a drachm of the extract twice a day. Either a strong decoction or the fresh expressed juice, in doses from two ounces to four, two or three times within the twenty-four hours, will, however, be found more active preparations.

LEONARUS CARDIACA. *Motherwort.* The leaves.

This is a very common indigenous plant, growing in waste places, and flowering in July and August. The stalk is square, the leaves are spear shaped and three lobed. The flowers are in thorny whorls, purplish within, and white on the outside. The leaves are opposite, two to each whorl. They have a strong, disagreeable odour, and bitter taste.

Motherwort was formerly supposed to be useful in some nervous and hysterical complaints. and as a strengthener

of the stomach. Its medicinal virtues are not undeserving of notice. Though rejected from pharmacopœias, it will not readily be abandoned by the female class, being peculiarly adapted to some constitutions when affected with nervous and hysterical agitations. An infusion of this plant is a common domestick medicine, taken at bed time; it composes and procures refreshing sleep in a manner similar to valerian, when it could not be obtained by the operation of opium.

LICHEN ISLANDIUS. *Iceland Moss.* The herb.

This is a species of liverwort, or rock moss, of which there are many varieties. It is brought from Iceland, where the inhabitants make considerable use of it as an article of diet, and esteem it an excellent remedy in consumption. Of late years it has attracted the attention of physicians in the United States, and acquired considerable repute for its remarkable mucilaginous and nutritive properties. It has a bitter and somewhat astringent taste, which are in some measure destroyed by drying or infusing in water. As a medicine, *Scopoli* and *Haller* recommended it in coughs and consumptions, and it has proved efficacious in diarrhœas and dysentery. Doctor Kerr found it so successful in dysentery, that, after repeated emeticks and catharticks, he never used any other medicine, except that he occasionally added opium. Dr. Crichton has a high opinion of it only in two species of consumption: the *phthisis hæmoptoica* and the *phthisis pituitosa* vel *mucosa;* for by the use of this, he has seen patients get so far the better, as to be dismissed from the hospitals cured. It is given in decoction, boiling one ounce and a half in two pounds of milk, *over a slow fire, exactly one quarter of an hour.* If milk disagree, water may be used, to which, after straining, a sufficient quantity of sugar may be added to make a syrup. Three or four ounces of this are to be taken frequently in a day. When continued for several months, it has been found extremely serviceable as a restorative in consumptive cases, attended by debility and an acrimonious state of the blood and juices.

LINUM USITATISSIMUM. *Common Flax.* The seeds and their fixed oil.

Linseed contains about one fifth of mucilage, and one sixth of fixed oil. It is therefore considered as emollient and demulcent. The entire seeds are only used in cataplasms. The mucilage resides wholly in the skin, and is separated by infusion or decoction. The infusion is used as a pectoral drink, and in ardor urinæ, nephritick pains, and during the exhibition of corrosive sublimate. Flaxseed syrup is made by adding to two pints of the mucilage, one pint of honey; while simmering away by a gentle heat observe to take off the scum as it rises. This is highly useful in all kinds of coughs, and other diseases of the breast and lungs. The oil is separated by expression. It is one of the cheapest fixed oils; but is generally rancid or nauseous, and unfit for internal use. These seeds, when reduced to powder and properly blended with hot water, form one of the most convenient and useful of cataplasms.

The cake which remains after expression of the oil, contains the farinaceous and mucilaginous part of the seed, and is used in fattening cattle, under the name of oil cake.

LIRIODENDRON TULIPIFERA. *Tulip bearing Poplar. Tulip Tree.* The bark of the root.

A native and well known tree in the United States, called also American poplar, white wood, and in some parts of New England improperly called *cypress* tree. It attains to a very large size, rising as high as any forest tree, and makes a noble and beautiful appearance when in flower, about the middle of May. This tree is remarkable for the shape of its leaves. having the middle lobe of the three truncate, or cut transversely at the end. The flowers are large and bell shaped; calyx of three leaves, six petals to the corolla, marked with green, yellow, and red spots; and many lance shaped seeds, lying one over another, and forming a sort of cone. The bark of the root has long been employed by medical men in the United States, as a tonick, and when joined with various proportions of *prinos virticillatus*, and *cornus florida*, has afforded a remedy of equal efficacy with Peruvian bark.

It is a strong bitter, and considerably aromatick and antiseptick, and has been found particularly beneficial in the last stage of dysentery. The powdered root combined with steel dust is an excellent remedy in relation of the stomach. According to Dr. Barton, the bark is used in some parts in gout and rheumatism. A decoction of it is said to be a common remedy in Virginia for botts in horses.

"The liriodendron tulipifera, tulip or poplar tree, grows throughout the United States of North America. The best time to procure the bark for medicinal purposes, is in the month of February; as the sap at this time, being more confined to the root increases its virtue. It possesses the qualities of an aromatick, a bitter, and an astringent; the bitter quality is greater, the astringent less, than in the Peruvian bark. It likewise possesses an aromatick acrimony; hence I infer, it is highly antiseptick and powerfully tonick. I have prescribed the poplar bark in a variety of cases of the intermittent fever; and can declare from experience, it is equally efficacious with the Peruvian bark, if properly administered. In the phthisis pulmonalis, attended with hectick fever, night sweats, and diarrhœa, when combined with laudanum, it has frequently abated these alarming and troublesome symptoms. I effectually cured a Mr. Kiser, fifty years of age, who was afflicted with a catarrh and dyspeptick symptoms for five years, which baffled the attempts of many physicians, and the most celebrated remedies, by persevering in the use of the poplar bark for two weeks.

"I can assert from experience there is not in all the materia medica, a more certain, speedy and effectual remedy in the hysteria, than the poplar bark combined with a small quantity of laudanum. I have used no remedy in the cholera infantum but the poplar, after cleansing the primæ viæ, for these two years. It appears to be an excellent vermifuge. I have never known it fail in a single case of worms which has come under my observation. I prescribed it to a child when convulsions had taken place. After taking a few doses, several hundreds of dead ascarides were discharged with the stools. The dose of the powder to an adult, is from a scruple to two drachms; it may likewise be used in tincture, infusion, or decoction; but its virtues are always greatest when given in substance."

The foregoing is part of a letter addressed to governour Clayton, of Delaware, in 1792, by Dr. J. T. Young, of Philadelphia. (American Museum, vol. 12.) In his reply, the governour observes, "During the late war the Peruvian bark was very scarce and dear. I was at that time engaged in considerable practice, and was under the necessity of seeking a substitute for the Peruvian bark. I conceived that the poplar had more aromatick and bitter than the Peruvian, and less astringency. To correct and amend those qualities I added to it nearly an equal quantity of the bark of the root of *dogwood* (cornus florida or boxwood) and half the quantity of the inside bark of the white oak tree. This remedy I prescribed for several years, in every case in which I conceived the Peruvian bark necessary or proper, with at least equal if not superiour success. I used it in every species of intermittent gangrenes, mortifications, and in short in every case of debility. It remains to determine whether the additions of those barks to the poplar increases its virtues or not; this can only be done by accurate experiments in practice."

A further account of the analysis and virtues of this medicine is given by professor Rush in the transactions of the college of physicians of Philadelphia, and in a paper published in one of the volumes of Tilloch's Phil. Magazine.

LOBELIA INFLATA. *Lobelia Emetica. Emetick Weed. Indian Tobacco.* The leaves.

The lobelia inflata is indigenous, and annual, rising to one or two feet, with branched stems. The leaves are oblong, alternate; slightly serrated and sessile. The blossoms are solitary, in a kind of spike, of a pale blue colour. It is found common in dry fields, among barley and rye stubble; and flowers in July and August; its capsules are inflated, and filled with numerous small seeds.

The leaves chewed are at first insipid, says Dr. Cutler, but soon become pungent, occasioning a copious discharge of saliva. If they are held in the mouth for some time, they produce giddiness and pain in the head, with a trembling agitation of the whole body; at length they bring extreme nausea and vomiting. The taste resembles that of tartar emetick. A plant possessed of such active pro-

perties, notwithstanding the violent effects from chewing the leaves, may possibly become a valuable medicine.

It was employed by the aborigines as an emetick, and also by those empiricks who affect to deal in Indian remedies only. As a new article, it has lately excited much speculation in the New England states; and its properties have very frequently been subjected to the test of practical experiment. It is found to operate as a speedy and active emetick, and it often induces a most profuse perspiration immediately after being received into the stomach. It has proved serviceable in cases of colick, where emeticks were indicated. In a variety of instances it has been administered as a remedy in asthmatick affections; and on competent authority we are assured, that it has in general manifested considerable efficacy, and sometimes proved more beneficial in this distressing disease than any other medicine. From some of its effects, says an eminent physician, lobelia seems to be related to the narcotick plants; to the mouth and first passages it proves acrid and highly stimulant; its stimulus appears to be of the diffusive kind, as Dr. Cutler, on taking it, experienced an irritation of the skin over the whole body. It is probably one of the most powerful vegetable substances with which we are acquainted, and no rational practitioner will have recourse to it, but with the greatest precaution. The melancholy consequences resulting from the use of *lobelia inflata*, as lately administered by the adventurous hands of a noted empirick, have justly excited considerable interest, and furnished alarming examples of its deleterious properties and fatal effects. The dose in which he is said usually to prescribe it, and frequently with impunity, is a common teaspoon full of the powdered seeds or leaves, and often repeated. If the medicine does not puke or evacuate powerfully, it frequently destroys the patient, and sometimes in five or six hours.

Even horses and cattle have been supposed to be killed by eating it accidentally. The specifick qualities of this highly active plant, promising to be of utility as a remedy, should be particularly investigated by ingenious and intelligent men, that its rank in the materia medica may be clearly ascertained.

The following highly interesting observations have been recently received from the Rev. Dr. M. Cutler.

When I was preparing my botanical paper, says the Dr. I had given it (the lobelia) only a cursory examination;

and having some doubt about its specifick characters, I suspected it to be a new species. Accidentally ascertaining its emetick property, I inserted it with the specifick name, *emetick weed.* By chewing a small part of it, commonly no more than one or two of the capsules, it proves a gentle emetick. If the quantity be a little increased, it operates as an emetick, and then as a carthatick, its effects being much the same as those of the common emeticks and catharticks. It has been my misfortune, the author observes, to be an asthmatick for about ten years. I have made trial of a great variety of the usual remedies with very little benefit. In several paroxysms I had found immediate relief more frequently than from any thing else, from the skunk-cabbage. (*Dracontium fœtidum.* Lin. *Arum Americanum. Catesby.* See that article in this volume.) The last summer I had the severest attack I ever experienced. It commenced early in August, and continued about eight weeks. Dr. Drury, of Marblehead, also an asthmatick, had made use of a tincture of the Indian tobacco, by the advice of a friend, in a severe paroxysm early in the spring. It gave him immediate relief, and he has been entirely free from the complaint from that time. I had a tincture made of the fresh plant, and took care to have the spirit fully saturated, which I think is important. In a paroxysm which perhaps was as severe as I ever experienced, the difficulty of breathing extreme, and after it had continued for a considerable time, I took a table spoonful. In three or four minutes my breathing was as free as it ever was, but felt no nausea at the stomach. In ten minutes I took another spoonful, which occasioned sickness. After ten minutes I took the third, which produced sensible effects upon the coats of the stomach, and a very little moderate puking, and a kind of prickly sensation through the whole system, even to the extremities of the fingers and toes. The urinary passage was perceptibly affected by producing a smarting sensation in passing urine, which was probably provoked by stimulus upon the bladder. But all these sensations very soon subsided, and a vigour seemed to be restored to the constitution, which I had not experienced for years. I have not since had a paroxysm, and only a few times some small symptoms of asthma. Besides the violent attacks, I had scarcely passed a night without more or less of it, and often so as not to be able to lie in bed. Since that time I have enjoyed as good health as, perhaps, before the first attack.

I have given you this minute detail of my own case, from an apprehension that this plant, judiciously employed, may approach nearer to a specifick in this most distressing complaint, than any other that has been yet discovered. But I am aware much further experiment is necessary to ascertain its real value. Several medical gentlemen have since made use of the tincture in asthmatick cases with much success, but the effects have not been uniformly the same. In all instances of which I have had information, it has produced immediate relief; but the effect has been different in different kinds of asthma. Some patients have been severely puked with only a teaspoonful; but in all cases some nausea seems to be necessary. The asthma with which I have been afflicted, I conceive to be that kind which Dr. Bree, in his *Practical Inquiries on disordered respiration*, &c. calls the first species—"a convulsive asthma from pulmonick irritation of effused serum." My constitution has been free, I believe, from any other disorder, than what has been occasioned by an affection of the lungs, anxiety of the præcordia, and straitness of the breast, and other symptoms produced by that affection. In similar asthmas, the tincture has been as successful as in my case. It is extremely desirable that careful experiments should be made by men of real medical knowledge.

With the view of establishing a uniformity of strength in the preparation, the Essex district medical society have agreed, that the proportion for the tincture of lobelia shall be two ounces of the dried plant to one pint of diluted alcohol.

The result of subsequent practical observation has amply confirmed the utility of lobelia inflata in various diseases. In numerous instances of asthma it has procured the most essential relief, though in general its effects were only temporary and palliative. As a pectoral it has been found useful in consumptive and other coughs depending on mucus accumulated in the bronchial vessels by exciting nausea and expectoration. From its very speedy operation as an emetick, and its stimulating effects on the mouth and fauces, beneficial results might be expected from its use in croup and hooping cough; and on some trials our expectations have been realized in this respect. More extensive practical knowledge of the properties of this plant, and the various forms and circumstances of its administration is still, however, a most desirable object. This medicine

is endowed also with diuretick properties; and it is by some practitioners successfully employed in small doses in pills to promote the discharge of urine.

The leaves should be collected in August while the plant is in blossom, and carefully dried and preserved for use. From ten to twenty grains of the powdered leaves will in general be found a suitable dose as an emetick for an adult, or it may be repeated in smaller quantities. As a pectoral it may be given in powder or pills alone, or combined with other remedies, repeated in small doses till an evident good result is observable. Of the saturated tincture, twenty, forty, or even sixty drops may be safely given children of one or two years old, increasing as occasion may require.

Lobelia Syphilitica. *Lobelia.* The root.

This plant grows in moist places in Virginia. It is perennial, has an erect stalk, three or four feet high, blue flowers, a milky juice, and a rank smell. The root, which is the part used, consists of white fibres about two inches long, resembles tobacco in taste, which remains on the tongue, and is apt to excite vomiting.

Dr. Barton says, it is considerably diuretick; and Mr. Pearson found, that it generally disagreed with the stomach, and seldom failed of affecting the bowels as a strong cathartick. It certainly possesses no power of curing syphilis; even the Indians who have the disease, are glad of an opportunity of applying to the whites. It is said to have cured gonorrhœa.

Lytta Vittata. *Potato Fly.*

There are four species of meloe that blister, found in the United States. The lytta vittata was first brought into notice by Dr. Isaac Chapman, of Buck's county, Pennsylvania. It feeds principally upon the potato vine, and, at the proper season of the year, may be collected in immense quantities. This insect has a very near resemblance, in its outward form, to the meloe vesicatorius, or Spanish fly; but is rather smaller, and of a very different colour; the head is a very light red, with black antennæ; the elytra or wing cases are black, margined with pale yellow, and a stripe of the same colour extends along the middle of them; the tarsi have five articulations; the mouth is armed with jaws, and furnished with tarsi.

In the abdomen of this fly, is a hard, white substance, about the size of a grain of wheat, which, when powdered, appears like meal, and, when rubbed with water, forms a milky emulsion.

The experiments and investigation of Dr. Chapman have proved, that, when applied to the human system, the effects of the potato fly are perfectly analogous to those of the Spanish cantharis; being equal, if not superiour to them in medicinal powers.* The lytta vittata is now introduced into the materia medica of the Massachusetts pharmacopœia, and its properties have been made the subject of a valuable communication to the medical society of Massachusetts, by Dr. John Gorham, of Boston. From this interesting paper it appears, that for some years past, the potato fly has been employed as a vesicatory by Dr. Israel Allen, of Sterling. That the insect, in its dried state, is from four to six lines in length, its head and elytra are uniformly black, and the latter want the margin and stripe of yellow, observable in that described by Dr. Chapman. Its belly is ash coloured, and in the cavity of the abdomen is found the hard white substance already described. The thickness of the potato fly, which is nearly uniform throughout, is from one quarter, to one third its length. It generally appears on the vines, about the end of July, and the first week in August. They inhabit the soil at the foot of the plant; they ascend in the morning and afternoon, but generally avoid the heat of the sun at noon. As they fly with great difficulty, they are easily caught, and are prepared for medicinal purposes, by shaking them from the plant into hot water, and afterwards drying them by the sun's rays. Dr. Gorham proceeds to observe, that he has instituted an extensive series of experiments with the lytta vittata; and that they have never failed, even in a single instance, of producing all the immediate effects which he anticipated, from their external application, or internal exhibition: as a vesicatory, he has found them equal, if not superiour to the cantharis usually employed for that purpose in this country. The saturated tincture has been administered internally, in many cases of diminished sensibility of the urinary organs, in gleets, and as a diuretick in dropsy; and it has been found, in all, to increase the discharge of urine, and to produce a considerable irritation in the urethra, and in

* Med. Repos. vol. 2.

the neck of the bladder. It appears, therefore, from the combined testimony of Drs. Chapman, Gorham, and Allen, that physicians, in various parts of the country, may collect from their own fields, an annual visitor, possessing all the properties of the genuine cantharis. This indigenous production cannot fail of being generally adopted as an excellent substitute for an expensive exotick, not always to be obtained.

We shall notice another kind of indigenous blistering fly, the *meloe niger* of professor Woodhouse, or the Pennsylvanicus of Linnæus. This is not more than half the size of Chapman's fly, and is uniformly black. It feeds upon the *prunella vulgaris*, or self heal, and *ambrosia trifida*, or stick weed. During the month of August, the farmers of New England find them in immense quantities, extracting nourishment from the potato vine, which in some seasons they almost destroy. These flies, it is well ascertained, are not inferiour in point of efficacy to any other species, whether of foreign or domestick production; and they seldom excite strangury when applied externally.

MALVA ROTUNDIFOLIA. *Round leaved Mallow, or common Mallow.* The leaves.

This is an annual plant, growing in hedges, foot paths, and among rubbish. The whole plant abounds with mucilage. The leaves were formerly often used in food, to prevent costiveness. At present, decoctions of the plant are sometimes prescribed in dysenteries and urinary complaints; though it is chiefly employed in emollient cataplasms, clysters, and fomentations.

MARANTA ARUNDINACEA. *Indian Arrow Root.* The root.

This plant was originally the production of the East Indies, and is now cultivated in Jamaica and other West India Islands, and in South America. Arrow root agrees with sago, salep, and tapioca in its general nutritious property, but is reckoned to excel them, so far as to afford a much larger proportion of mucilage than any vegetable hitherto discovered. Hence it is of superiour utility as an article of diet for the sick and invalids, and particularly in cases of acrimony, either in the general habit, as in hectick fever or consumption; or in particular secretions.

as in affections of the urinary passages, namely, inflammation, stone, or gravel; and also in affections of the bowels, as in looseness and dysentery. It furnishes also an excellent remedy for the bowel complaints, which so commonly prevail in the United States during the warm season, especially among children. The jelly is made by adding to a table spoonful of the powdered root as much cold water as will make it into a soft paste, then pour on boiling water, stirring it at the same time briskly, until it become a clear jelly, which may be seasoned with sugar and nutmeg, or a little wine or lemon juice may be added. For children it may be prepared with milk; and if it ferment on the stomach, the addition of a little animal jelly will obviate that effect. Prepared in the form of pudding the arrow root powder is far preferable to any of the farinaceous substances, and affords a delicate and very proper food for convalescent patients. According to Dr. Wright, of Jamaica, a decoction of the fresh root makes an excellent ptisan in acute diseases. In a pamphlet published in 1796, by Mr. T. Rider, we find the culture of this valuable article highly recommended to the West Indian planters, and the new African colonists, as an object of commerce, and the most eligible substitute for starch made of wheat. By the author's computation, eight millions of pounds weight of starch are made annually in Great Britain alone from that valuable grain. It appears also by the same authority that arrow root starch is of the finest quality, and that one pound of it is equal to two pounds and a half of that prepared from wheat. Fortunately the arrow root has of late years been introduced into the states of South Carolina and Georgia, and by practical experiment it is ascertained that the soil of the southern sea coast is well adapted to it. John Cooper, Esq. an opulent planter on St. Simon's, and Campbell Wylly, Esq. of Sapelo island, have, it is understood, so far succeeded in their attempts as to afford the most flattering encouragement, that this important article may be added to the numerous sources of wealth enjoyed by our southern planters. The latter gentleman asserts, that a spot of land on his plantation yielded arrow root sago in the proportion of 1840 pounds to the acre. No production it is presumed can promise a more ample remuneration, to stimulate the planter to attempt its cultivation; and when it is considered, that, in proportion to the produce, the demand will be extended,

its claim as a rival staple with rice and cotton may, perhaps, be anticipated.

MARRUBIUM VULGARE. *White Horehound.* The leaves.

This is a perennial plant, which grows wild on road sides, and among rubbish. The leaves have a very strong, not disagreeable smell, and a roughish, very bitter taste. It is reputed to be both attenuant and resolvent; an infusion of the leaves in water, sweetened with honey, is recommended in asthmatick and phthisical complaints, as well as in most other diseases of the breast and lungs. They promote the fluid secretions in general, and liberally taken, loosen the belly.

Dr. Withering observes that it was a favourite medicine with the ancients in obstructions of the viscera. He says, that it is the principal ingredient in the negro Cæsar's remedy for vegetable poisons. That a young man who had occasion to take mercurial medicines, was thrown into a salivation which continued for more than a year. Every method that was tried to remove it, rather increased the complaint. At length Linnæus prescribed an infusion of this plant, and the patient got well in a short time.

MEL. *Honey.*

A sweet fragrant vegetable juice, collected by bees from the flowers of various plants, and deposited in the cells of the comb. The honey produced by young bees, and which flows spontaneously, is purer than that expressed from the comb; whence it is called virgin honey: the best sort is of a thick consistence, and of a whitish colour inclining to yellow; it possesses an agreeable smell and a pleasant taste. In some situations, where noxious plants abound, poisonous honey is met with, from the bees feeding on such flowers. As an article of food, when immoderately used, honey is pernicious to weak stomachs; it ought therefore to be avoided by persons liable to eruptions of the skin, or in whom there is a redundancy of bile. This vegetable substance contains an acid similar to that of sugar, but is more spiritous: hence it readily ferments, occasions flatulency, and in some habits produces gripes and looseness. As a medicine, however, it is a very useful aperient and

expectorant, especially when it has been previously boiled; in which state, it may be used with safety and advantage by asthmatick patients; for it tends to dissolve viscid humours, and to promote the expectoration of tough phlegm.

Honey is also convertible into an agreeable liquor termed mead; and it may be advantageously employed in the following manner: dissolve one pound of honey in three or four quarts of water, and being exposed to a temperature between the 70th and 80th degree of *Fahrenheit's* thermometer, it will in a short time become a very agreeable acid liquor. which possesses an aromatick flavour and strength, superiour to that of the best of vinegar made of white wine. This cheap and agreeable substitute for white wine vinegar appears to deserve every attention in domestick economy.

MELALEUCA LEUCADENDRON. *The Cajeput Tree.* The volatile oil.

The tree which furnishes the cajeput oil is frequent in the East Indies. The essential oil, obtained by distillation from the leaves and fruit, has a green or yellowish colour, a strong fragrant odour, and an extremely pungent taste. It is highly volatile. This oil has been used as a highly diffusible stimulant and antispasmodick, in tympanites, hysteria, palsy, chronick rheumatism, and various other diseases of debility. Its dose is three or four drops. It is also applied externally to relieve rheumatick and gouty pains, and violent headaches. But its most remarkable effect is in that painful complaint the toothache. From whatever cause this affection may proceed, whether from a carious tooth, rheumatick acrimony, catarrh, &c. the cajeput oil has generally been found efficacious in removing it, if dropped on lint, and placed in the cavity of the tooth, or even around the gum.

MELIA AZEDARACH. *Poison Berry Tree. Pride of India or China.* The fruit and root.

This is not a native of America, but is now completely naturalized to the states of Carolina and Georgia; where it is highly valued for the beauty of its foliage, and agreea-

ble shade, which it affords during the sultry season. In the city of Savannah the streets and publick walks are ornamented by rows of this charming tree, and the compiler has recently been gratified with the enchanting view which they exhibit. The azedarach has also obtained considerable repute for the medicinal virtues which it is found to possess. Professor Barton says, it is one of the most valuable anthelminticks that has hitherto been discovered, and many respectable physicians in Savannah repose the fullest confidence in its efficacy. To Dr. L. Kollock, vice president of the Georgia medical society, we are indebted for the following information. "It is a vermifuge of efficacy. Its use is in some measure general among the planters; and with many supersedes the use of all others. I have given it with success where all others in common use have failed of relieving. But when given in the months of March and April, while the sap is mounting into the tree, it has sometimes been followed by stupor, dilatation of pupil, stertorous breathing, subsultus, &c. But these symptoms, like those sometimes produced by spigelia, pass off without any perceptible injury to the system. This article, like the spigelia, is also a useful febrifuge medicine, in those affections usually denominated verminous fevers, but where no worms are voided. The common form is that of decoction. A large handful, say about four ounces of the bark of the fresh root, is boiled in a quart of water, till it acquire the colour of strong coffee, i. e. to about a pint, of which from half an ounce to an ounce may be given every two or three hours till it operate. Given in this manner, its operation is powerful, sometimes both vomiting and purging. The strength of the decoction is however varied according to the intention." The dried berries of this tree have been advantageously employed as an anthelmintick, in Carolina; children being allowed to eat them at pleasure. The pulp of the fruit formed into an ointment with lard, it is said, has been successfully employed in tinea capitis.

MELISSA OFFICINALIS. *Balm.* The leaves.

Balm is much cultivated in our gardens on account of its pleasant aromatick smell, resembling that of the lemon, and its fragrant though roughish taste. It is principally employed in the form of a watery infusion, which is drunk

in the manner of tea ; and in acute fevers, when acidulated with the juice of lemon, it is a useful diluent.

Meloe Vesicatorius. *Cantharis. Spanish Flies.*

The cantharis is an insect, collected from the leaves of plants in Spain and Italy, and dried in the sun. It is of a lively green colour; has a faint unpleasant smell, and a taste slightly acrid. The active matter of this insect inflames and excoriates the skin, and is used as the basis of the common vesicatories. Taken internally they often occasion a discharge of blood by urine, with exquisite pain: if the dose be considerable, they seem to inflame and exulcerate the whole intestinal canal; the stools become mucous and purulent; the breath fœtid and cadaverous; intense pains are felt in the lower belly: the patient faints, grows giddy, delirious, and dies. Applied to the skin, they first inflame, and afterwards excoriate the part, raising a more perfect blister than any of the vegetable acrids, and occasioning a more plentiful discharge of serum. But even the external application of cantharides is often followed by a strangury, accompanied with thirst and feverish heat. The inconveniences arising from the use of cantharides, whether taken internally, or applied externally, are best obviated by drinking plentifully of bland emollient liquids, such as milk, decoctions of barley, linseed, solutions of gum arabick, &c. or by pouring warm water from a bottle, upon the lower part of the belly, as the person lies in bed. The specifick property of counteracting cantharides ascribed to camphor, says Dr. Duncan, has no foundation. Internally administered, it acts with much violence on the urinary passages. In dropsy, it has been given as a diuretick, in a dose of one grain once or twice a-day, or a few drops of the tincture continued for some time: it has been prescribed in a similar manner in obstinate gleet and leucorrhœa, and in retention of urine arising from debility of the body, of the bladder, or in the opposite affection of incontinence of urine from debility of the sphincter. It is principally in these two last affections, that the internal administration of cantharides is attempted. The tincture has been of late much recommended in tetanus, &c. and in some instances has proved useful.

Applied externally, cantharides are one of our best and most powerful remedies. By proper management they may be regulated so as to act as a gentle stimulus, as a rubefacient, or as a blister.

Blisters are applied, 1. To increase the activity of the system in general, by means of their irritation.

2. To increase the activity of a particular organ.

3. To diminish morbid action in particular organs, by means of the irritation they excite in the parts to which they are applied.

They may be employed with advantage in almost all diseases accompanied with typhus fever, especially if any important viscus, as the brain, lungs, or liver, be at the same time particularly affected. In these cases the blisters are not applied to the diseased organs themselves, but as near them as may be convenient. When we wish to excite action in an organ, the blisters are, if possible, applied directly to the diseased organ.

Cantharides are employed externally, either in substance, mixed up with wax and resin, so as to form a plaster, or ointment, or in the form of tincture.

After a blister has been raised, it is often of advantage to convert the serous into a purulent discharge, by exciting suppuration, which is done by applying to the blistering part any acrid stimulating ointment; one, for example, containing a small proportion of powdered cantharides; which answers the purpose by the irritation it keeps up, or which is preferable, the savine cerate, the favourite application of Mr. Crowther. It is a practice often employed with advantage in asthma, paralysis, and a variety of chronick affections. Dr. Philip S. Physick, and Dr. Rush, have in several instances experienced the efficiency of blisters to arrest the progress of mortification when applied to the diseased part.

MENTHA VIRIDIS. *Spearmint.* The herb.

Spearmint is perennial and grows on the banks of rivers, and in watery situations; and flowers in the months of July and August. The leaves have a warm, roughish, somewhat bitterish taste; and a strong, not unpleasant, aromatick smell. Their virtues are stomachick and carminative.

MENTHA PIPERITA. *Peppermint.* The herb.

Of the different mints, this is the one which has the greatest degree of pungency. The leaves have a strong, rather disagreeable smell, and an intensely pungent aromatick taste, resembling that of pepper; and accompanied with a peculiar sensation of coldness. They afford an essential oil, rich in the aromatick quality of the herb. It also contains a small portion of camphor.

Peppermint is used as a stimulant and carminative, to obviate nausea or griping, or to relieve the symptoms resulting from flatulence, and very frequently to cover the taste and odour of other medicines. It is also an excellent stomachick, of great use in flatulent colicks, languors, and hysterick cases, and in vomiting. It is used under the forms of the watery infusion, the distilled water, and the essential oil. This last being dissolved in a due proportion of rectified spirit of wine, and coloured with green grass, forms the essence of peppermint of the shops; a fashionable and pleasant carminative, which, when taken on sugar, imparts a glowing taste, sinking into the tongue, and extending its effects through the whole system, instantly communicating a glowing warmth.

MENTHA PULEGIUM. *Penny Royal.* The herb and flower.

This herb is perennial, and possesses properties similar to those of the mint; but it is more acrid, and less agreeable to the palate. It has long been esteemed as an aperient and deobstruent, particularly in hysterick and other female complaints. Dr. Withering observes, that the expressed juice of penny royal, with a little sugar, is a useful medicine in the hooping cough.

Penny royal is supposed by the common people to be useful in obstructed catamenia, and is a very common domestick medicine for that purpose. It is given either in saturated tincture, or strong infusion, to any extent.

MIMOSA CATECHU. *Catechu.* The extract of the wood called extract of catechu.

To this substance, formerly known by the absurd name of Japan earth, the appellation of catechu is now appropriated. It is an extract prepared by boiling the interiour wood of the tree with water, and the tenacious residual

mass is dried by exposure to the air and sun. It is of a yellow or brown colour, has a bitter and astringent taste, leaving an impression of sweetishness; but its qualities vary considerably. Two kinds are at present met with in the shops; one is of a light yellowish brown colour, is smooth and uniform in texture, breaks short, is soft and light; the other is of a dark brown colour, more heterogeneous, heavier, and considerably harder.

Catechu is almost entirely soluble in water, with the assistance of heat, the residuum consisting of accidental impurities. It is nearly equally soluble in alcohol. Its solution strikes a deep black colour with the salts of iron, and gives an abundant precipitate with animal gelatin. From Mr. Davy's experiments, it appears to be composed of tannin, extractive matter, and mucilage; the proportions in the best catechu being 54.5 of the first, 34 of the second, 6.5 of the third, and 5 residual matter. Our knowledge with regard to the principal named extract, is so imperfect, that it is difficult to establishany certain conclusion with regard to it; and the subsequent experiments of Dr. Bostock, as to the modes of separating what is called extract from the tannin of catechu, do not exactly accord with those of Mr. Davy. Dr. Bostock has remarked, too, that catechu gives indications of the presence of gallick acid, and that its watery infusion even reddens the more vegetable delicate colours.

Catechu is in common use as an astringent, and in the uniformity and certainty of its operation is probably equal, or even superiour to any of the vegetable astringents. It is used in diarrhœa generally under the form of the infusion, or the tincture: or the officinal preparation, the electuary of catechu, consisting of catechu and kino, with some aromaticks and a little opium, is diffused in water, forming what has been named the Japonick mixture. In substance it may be given in a dose from ten to forty grains, which may be frequently repeated. Under the form of troches, it is sometimes used in relaxation of the uvula, or sponginess of the gums, being allowed to dissolve slowly in the mouth. It is also successfully employed in complaints peculiar to females, laxity and debility of the viscera in general, and in various other diseases, which require strengthening remedies. As a mild, but excellent astringent it is applied with much advantage to aphthous eruptions, or the thrush, and similar affections.

Mimosa Nilotica. *Egyptian Mimosa. Gummi Arabicum.* The gum, called gum arabick.

This, the purest of the gums, is obtained by exudation from the mimosa, which grows in the sandy deserts of Africa, Arabia Petræa, and Egypt. There are two kinds of gum found in the shops, and sold promiscuously, distinguished by the names of gum arabick, and East India gum. Gum arabick consists of roundish transparent tears, colourless, or of a yellowish colour, shining fracture, without smell or taste, and perfectly soluble in water. The pieces which are most transparent, and have least colour, are reckoned the best. They are sometimes selected from the gum arabick in sorts, and sold for about double the price, under the title of picked gum.

It has all the properties of gum; is insoluble in alcohol or oils, and soluble in water, forming a viscid solution termed mucilage. Gum arabick is used as a demulcent. In catarrh it is allowed to dissolve slowly in the mouth, and its mucilage is the basis of the mixtures usually employed to allay coughing. Its solution in water, more or less viscid, is frequently exhibited in diarrhœa, dysentery, tenesmus, strangury, and ardor urinæ. In pharmacy, mucilage of gum arabick is employed for a variety of purposes. It serves to suspend heavy powders in water; it gives tenacity to substances made into pills, and it effects a partial union of oils, balsams, and resins, with water.

Gum, says Dr. Duncan, is highly nutritious. During the whole time of the harvest, of the journey, and of the fall, the Moors of the desert live almost entirely upon it; and experience has proved, that six ounces are sufficient for the support of a man during twenty-four hours.

M. Golberry says, that he saw a young Englishman in Gambia recover from a very severe hæmoptysis, by taking three ounces of gum, daily, dissolved in milk.

Momordica Elaterium. *Wild Cucumber.* The fresh fruit when almost ripe.

This is the production of European countries: it is the inspissated juice of the fruit that is known by the name of elaterium, and comes in thin cakes, resembling colocynth. In the days of Sydenham, it was considerably employed as a drastick cathartick in hydropick cases, but, from its deleterious effects, it was not in general practice. If

incautiously administered, it produces severe nausea, serous evacuations, and generally violent vomitings, and the whole system is brought into action. Dr. Ferriar, of Manchester, recommends an extract of the elaterium, as surpassing every other medicine, in the power of removing serous accumulations, and as affording astonishing relief in the dyspnœa, arising from hydrothorax and ascites. Dr. F. has related the particulars of twenty cases in which the elaterium was prescribed with various success. Upon its first exhibition to a patient it is nearly as active and as dangerous, if incautiously given, as arsenick. Dr. Hosack having prescribed the elaterium in the New York Hospital, fully coincides with Dr. F. in opinion respecting its active powers and efficacy as a powerful hydragogue. From the violence of its operation it cannot at first be used with safety, in larger doses than a quarter or half a grain; but by being gradually increased, at intervals of a few hours, patients may frequently be brought to bear five or six grains a day. It may be conveniently exhibited, made into pills with extract of gentian.

Moschus Moschiferus. *The Musk Deer.* The substance contained in a follicle situated near the navel, called musk.

The musk animal is an inhabitant of China, India, and Tartary. It is a gentle and timid animal; its general form resembles the deer tribe, and is about three feet in length. In the male, behind the navel, and before the prepuce, there is situated an oval bag, flat on one side, and convex on the other, about three inches long and two broad. In the adult animal this sack is filled with a secreted matter, known by the name of musk.

Fine musk comes to us in round thin bladders, which are generally about the size of a pigeon's egg, covered with short brown hairs, lined with a thin brown membrane, well filled, and without any appearance of having been opened. The musk itself is dry, with a kind of unctuosity, of a dark reddish brown, or rusty blackish colour, in small round grains, with very few hard black clots, and perfectly free from sandy or other visible foreign matter. If chewed, and rubbed with a knife on paper, it looks smooth, bright, yellowish, and is free from grittiness. Its taste is somewhat bitterish, and its smell extremely powerful and peculiar. Musk yields part of

its active matter to water, by infusion; by distillation the water is impregnated with its flavour; alcohol dissolves it, the impurities excepted. It is more effectually given in substance than under any preparation that has been attempted. The proper dose of genuine musk is from ten to thirty grains; and even when these large doses are found to be effectual, they must be repeated after no long intervals till the disease is entirely overcome. There is a manifest difference in the quality of musk, and the strength can be judged of only by the strength of its odour. Genuine musk has been successfully employed in those cases of retrocedent gout which affect the stomach, lungs, and head.

Musk is a medicine of very great efficacy, and for which, in some cases, there is hardly any substitute. When properly administered, it sometimes succeeds in the most desperate circumstances. It raises the pulse without heating much; it allays spasms, and operates remarkably on the brain, increasing the powers of thought, sensation, and voluntary motion. It is administered with advantage in the greater number of spasmodick diseases, especially in hysteria and singultus, and also in diseases of debility. In typhus it is employed to relieve subsultus tendinum, and other symptoms of a spasmodick nature. In cholera it frequently stops vomiting; and, combined with ammonia, it is given to arrest the progress of gangrene. It is also used with the greatest benefit in exanthematous and phlegmonick diseases, accompanied with typhoid fever; and also in chin cough, epilepsy, trismus, &c. Its dose is from six to twenty grains, repeated, if necessary, every five or six hours. It is best exhibited in the form of bolus. To children, it is given in the form of enema, and is an efficacious remedy in the convulsions arising from dentition.

Artificial musk is made by pouring three and a half drachms of nitrick acid on one drachm of oil of amber, and washing the product. It is prescribed for the same purposes as the natural musk, and in the same dose. This article is considered, by good authorities, fully equal in efficacy to the genuine kind, and has obtained much repute as a remedy in some irregular spasmodick actions, and in neuroses generally. In pertussis, artificial musk has been given with such success as to secure the confidence of the most experienced physicians in its powers. The dose for children is ten or twelve drops, graduated to the

age and circumstances. Both natural and artificial musk may be very conveniently exhibited in the form of julep as follows: Musk, two drachms; gum arabick, two drachms; loaf sugar, one ounce; water, six ounces. Dose, a table spoonful for adults every hour or two.

Murias.

Muriate is the generick term for those secondary compounds, which contain muriatick acid. The muriates may be divided into three families.

1. Alkaline muriates,—soluble in water, fusible and vaporizable without decomposition, forming no precipitate with alkaline carbonates.

2. Earthy muriates,—generally soluble in water, decomposable by heat, forming a white precipitate with alkaline carbonates.

3. Metalline muriates.—The muriatick acid is capable of combining with many metals, in two states of oxidizement. The muriates which contain the metal in the state of protoxide, are in general very acrid, and soluble both in water and in alcohol. The muriates which contain the metal in the state of peroxide are often insoluble, have a white colour, and contain an excess of base, or are submuriates. The muriates are also the most volatile of the metallick salts, and often rise undecomposed in sublimation or distillation.

Murias Ammoniæ. *Muriate of Ammonia. Sal Ammoniack.*

Muriate of ammonia is found native, especially in the neighbourhood of volcanos. It was first prepared in Egypt, from the soot of camel-dung, by sublimation. But the greatest part of that now used, is manufactured in Europe, either by combining directly ammonia with muriatick acid, or by decomposing the sulphate of ammonia by means of muriate of soda, or the muriates of lime and magnesia by means of ammonia. It is prepared in solid masses, semitransparent, and somewhat ductile. It is volatile in a small degree of heat; its alkali is extricated in pungent vapours on the admixture of quick lime; its acid is extricated in white fumes, on pouring concentrated sulphurick acid upon it. It dissolves in rather less than thrice its weight of water.

Sal ammoniack, when pure, promotes perspiration, and, in some cases, increases the secretion of urine. A drachm of it dissolved in water, if the patient be kept warm after taking it, generally proves sudorifick. By moderate exercise in the open air, it operates beneficially on the kidneys; given in a large dose, it proves aperient; and in a still larger, it acts as an emetick.

As a cooling and diaphoretick medicine, the sal ammoniack, dissolved either in vinegar and water, or combined with small doses of the Peruvian bark, has often been attended with the best effects, when taken in fevers, and especially in intermittents, after the intestinal canal has been properly evacuated.

This salt has also been employed externally in lotions and embrocations, for scirrhous and other indolent tumours; for removing warts and other excrescences, and in gargarisms for inflammation of the tonsils. Externally applied, sal ammoniack is a valuable remedy. It may act in two ways, 1. By the cold produced during its solution. It is from this cause that fomentations of muriate of ammonia probably prove beneficial in mania, apoplexy from plethora, lesions of the head, and in violent headaches. When used with this intention, the solution should be applied as soon as it is made. 2. By the stimulus of the salt. On this principle we may explain its action as a discutient in indolent tumours of all kinds, contusion, gangrene, psora, ophthalmia, cynanche, and in stimulating clysters. In some cases, as in chilblains, and other indolent inflammations, both modes of action may be serviceable. When first applied, the coldness of the solution will diminish the sense of heat and uneasiness of the part, and the subsequent stimulus will excite a more healthy action in the vessels.

Murias Sodæ. *Muriate of Soda. Common Sea Salt.*

This is the most common of all the neutral salts. It is not only found in immense masses, on, and under the earth's surface, and contained in great quantities in many salt springs; but it is the cause of the saltness of the sea. Common salt differs from all other neutral substances of this nature, in its taste being purely saline, and occasioning thirst after it has been swallowed. The primitive figure of its crystals is that of a cube; but, on evaporating a solution of salt, the small cubick particles assume

the secondary form of hollow squares. When the crystals are perfectly pure, they are not affected by moist air; and in this state, one hundred parts, according to Bergman, contain fifty-two of muriatick acid, or spirit of salt; forty-two of soda, or mineral alkali; and six of water of crystallization.

Nature furnishes us with this neutral salt, either in a solid state; in mines; or dissolved in the sea; or in saline springs. If it be obtained from the bowels of the earth, it is called rock-salt; and is generally very hard and transparent, though it is sometimes opaque, white, and sometimes of red, green, blue, or other shades. The purest of this kind is colourless; the other species are purified by solution in water, and by recrystallization, before they can be employed for culinary purposes. The principal mines of rock-salt are in the vicinity of Cracow, in Poland, and at Northwich, in the county of Chester. The salt, however, which is thus easily procured, and in very large masses, by no means affords a sufficient supply: hence numerous persons are employed in extracting it from *sea-water*, or from *saline springs*. The former yields only from one fiftieth to one thirtieth part of its weight; but the latter produce the greatest quantities; and we are informed by Dr. Brownrigg, that the celebrated saline springs in Great Britain contain more than one sixth part of good salt.

Common salt is obtained from these natural solutions by two different methods: first, the saline fluid is speedily evaporated, till the salt begins to concrete, and settle in the form of grains at the bottom of the pans; after which it is put into proper vessels for draining the brine: and when the process is completed, it is called *bay salt*. By the second method the evaporation is slow and gradual: so that it is continued only till a saline crust is formed on the surface of the liquor, which soon shoots into crystalline tubes.

The manufacture of salt in the United States is of more importance than is generally imagined. It appears, that from the 1st of October, 1800, to the 30th of September, 1801, 3,282,063 bushels of salt were imported, and of this quantity more than one third was imported from England. This salt, which chiefly comes from Liverpool, and the Mersey, according to Dr. Mitchell, is both weak and impure; as sea-water, brine springs, and rock salt, generally abound with various other earthy and saline ingre-

dients, such as lime, magnesia, epsom-salt, gypsum, glaubers salt, &c. all of which injure the quality of salt, and disqualify it from preserving animal flesh.

On the shores of Cape Cod, and some other parts of Massachusetts, marine salt is manufactured to very considerable profit and extent, from sea-water, evaporated by the rays of the sun. The whole annual amount cannot be estimated; great improvements having been made in the construction of the works, and in abridging the performance of labour, the manufacture is rapidly increasing. There is, however, every reason to conclude, that, with proper exertion and encouragement, this article might be furnished from our own shores, sufficiently abundant for the consumption of the New England states.

This domestick salt excels in purity, whiteness, and weight; and is not inferiour to the first quality of Isle of May salt. A circumstance which adds to its excellency, is, that during the process of evaporation, the lime is entirely separated from it, by subsiding to the bottom of the vats.

Basket salt, may be prepared from small fine crystals of common salt, which must be cleansed, or purified, by dissolving, and again evaporating to dryness; in which state it may be reduced to fine powder, and pressed hard into wicker-baskets, and dried at the stove or oven for use.

With respect to its medicinal properties, common salt, when taken in small quantities, promotes the appetite and digestion; but, if given in large doses, for instance, half an ounce, it operates as a laxative. It is useful in some cases of dyspepsia; and in large doses, it is said to check vomiting of blood. According to Dr. Rush, a table spoonful of fine salt, taken dry, has frequently afforded instant relief in hæmoptysis and other hæmorrhagies. It is a common ingredient in stimulating clysters, and is sometimes applied externally, as a fomentation to bruises, or in the form of bath, as a gentle stimulus to the whole surface of the body. [See the articles vinegar and lemon juice.]

Myrica Cerifera. *Bayberry. Wax Myrtle.*

The bayberry grows in every kind of soil, and varies in size, from two or three feet to six or seven in height. In autumn the fertile twigs are surrounded with bunches

of small, crowded, grayish berries, which remain after the leaves have fallen. The surface of these berries is covered with wax, which is obtained by boiling them in water, until the wax separates and floats upon the surface. This wax is used for candles, and as an ingredient in ointments. The bark of the root of this shrub is supposed to possess considerable medicinal virtues. It is much employed in domestick practice in jaundice from obstructions to the flow of bile. The bark of the root powdered has been exhibited as an emetick; and, according to Dr. James Mann, by whom it has been tried, its strength is equal to ipecacuanha. A more particular acquaintance with its medicinal properties ought to be attempted by practical experiment.

Myristica Moschata. *The Nutmeg Tree.* The kernel of the fruit, called nutmeg; its involucre, called mace; its fixed oil, called oil of mace; and its volatile oil.

Under the officinal name myristica, are comprehended nux moschata or nutmeg, and macis or mace; the former being the seed or kernel of the fruit, the latter the covering with which it is immediately surrounded. The tree which furnishes this elegant spice is a native of the Molucca islands. Nutmegs are round, of a grayish colour, streaked with brown lines, slightly unctuous; they have a strong aromatick flavour, and a pungent taste. They yield their active matter entirely to alcohol: distilled with water, they afford a fragrant essential oil; by expression, a sebacious oil is obtained from them, retaining their fragrant odour, and part of their pungency.

Nutmeg is used in medicine as a grateful aromatick, stomachick, and astringent: hence this drug has often been administered in diarrhœas and dysenteries, in doses from ten to twenty grains in powder, or in larger quantities, when infused in port wine. In violent headaches arising from a debilitated stomach, small doses of this medicine have frequently been found of real service; but, if injudiciously employed, it is apt to affect the head not unlike opium, and other powerful narcoticks.

Mace, the involucre of the nutmeg, is a thin unctuous membrane, of a yellowish colour, which it acquires by being dried in the sun. It emits a very fragrant agreea-

ble odour, and has a pleasant though acrid and oleaginous taste.

It is reputed to be an excellent carminative, and stomachick, possessing all the virtues of the nutmeg, with less astringency. Its oil, whether distilled or expressed, is equally efficacious; and when taken internally, in doses from one to five drops, frequently affords relief in colicks. Externally, it is of great utility, if rubbed on paralytick limbs; it also promotes digestion, and often prevents vomiting and hiccoughs on being applied to the region of the stomach.

MYROXYLON PERUIFERUM. *Sweet smelling Balsam Tree.*

The balsam, called Peruvian balsam.

This tree grows in the warmest provinces of South America, and is remarkable for its elegant appearance. Every part of it abounds with resinous juice, even the leaves are full of transparent resinous points like those of the orange tree.

The balsam, as brought to us, is commonly of the consistence of thin honey, of a reddish brown colour, inclining to black, an agreeable aromatick smell, and a very hot biting taste. It is said to be obtained by boiling the cuttings of the twigs in water, and skimming off with a spoon the balsam which swims on the top. Peruvian balsam consists of a volatile oil, resin, and benzoick acid. It is accordingly entirely soluble in alcohol, and in essential oils.

Balsam of Peru is a very warm aromatick medicine, considerably hotter and more acrid than copaiva. Its principal effects are, to warm the habit, to strengthen the nervous system, and to attenuate viscid humours. Hence its use in some kinds of asthmas, gonorrhœas, dysenteries, suppressions of the uterine discharges, and other disorders proceeding from a debility of the solids. It is also employed externally for cleansing and healing wounds and ulcers. "In several cases of tetanus that have fallen under my notice arising from wounds," says Dr. L. Kollock, of Savannah, "I have attributed the cure to the external application, and internal use, of balsam of Peru, whose influence has in several instances almost immediately controlled the spasms, and of itself restored the patient when rapidly sinking under the very liberal

use of opium, bark and wine. Two drachms in twelve or twenty-four hours is the largest quantity I have ever found it necessary to give."

MYRRHA. *Myrrh.* A gum-resin.

A gummy resinous concrete juice, obtained from a shrub growing in the East Indies, but of which we possess no certain account.

The best myrrh is somewhat transparent, of a uniform brownish, or reddish yellow colour; of a slightly pungent, bitter taste; with a strong aromatick, not disagreeable odour, though nauseous to the palate.

In its medicinal effects, this aromatick bitter, when taken internally, is supposed to warm and strengthen the stomach and other viscera; it frequently occasions mild diaphoresis, and, in general, promotes the fluid secretions. Hence it has been used with advantage in cases of debility; in diseases arising from suppression of the urine, or from immoderate discharges, in cachectick habits, and those persons whose lungs and throat are oppressed by viscid phlegm. It is farther believed to resist putrefaction in all parts of the body; on which account it is highly recommended in malignant, putrid, and pestilential fevers; and in the small pox. For these purposes it should be taken in doses of half a drachm or upwards; and it may also be usefully combined with nitre, cream of tartar, or some other cooling salt. Myrrh is an expectorant, which has been regarded as too stimulating to be employed in pneumonick affections, or in phthisis, but which has been often employed in asthma and chronick catarrh. Its dose is from ten to twenty or thirty grains. The tincture of myrrh is in common use externally as a stimulating application to foul ulcers, and to spongy gums.

MYRTUS PIMENTA. *Pimento Tree.* The fruit, called Jamaica Pepper.

This is a native of Jamaica, and grows in all the wood lands on the north side. The berries are pulled before they are ripe, and dried in the sun. The smell of this spice resembles a mixture of cinnamon, cloves, and nutmegs: its taste approaches to that of cloves, or a mixture of the three foregoing; whence it has received the name of *allspice.*

Pimento is a warm aromatick stimulant, and is much used as a condiment in dressing food. As a medicine it is advantageously substituted for the more costly spices, especially in hospital practice.

Nicotiana Tabacum. *Tobacco.* The leaves.

The tobacco plant is a native of America, where considerable quantities are annually raised for exportation. The leaves have a strong, disagreeable, narcotick smell, and a very acrid burning taste. The active constituent of tobacco is an essential oil; so active, that small animals are almost instantly killed, when wounded by a needle dipped in it; and a few drops of this oil taken internally have operated as a fatal poison. Hence the pernicious effects, which may result from smoking the leaves of this noxious plant, may be easily inferred.

The effects of tobacco are those of a powerful narcotick. Along with severe nausea and vomiting, it reduces the force of the circulation, and occasions extreme muscular debility, with insensibility and cold sweats. As a diffusible stimulant, the smoke of tobacco, thrown into the intestines, was at one time employed in the recovery of drowned persons, a practice now exploded as pernicious. It is employed with more advantage in ileus and incarcerated hernia, though it requires to be managed with much caution. The watery infusion, of the strength of half a drachm of the tobacco to one pound of water, is a more convenient mode of exhibiting it, as an enema. The smoke received into the mouth relieves the pains of toothache by its narcotick power, or by exciting a profuse salivary discharge. Reduced to powder, it proves an excellent errhine and sternutatory, when snuffed up the nostrils. In infusion it is also applied externally for the cure of psora, tinea, and other cutaneous diseases.

In an inaugural dissertation by Dr. Brailsford of South Carolina, (Philadelphia, 1799) the author asserts, that the evident operation of tobacco on the system, is that of a *sudorifick* and *emetick*, a *cathartick*, and a diuretick. Hence the propriety of its use, in a variety of diseases. In cases of ascites and other dropsical affections, it appears to be an invaluable remedy. As a diuretick it is excelled by few if any of our indigenous plants. Dr. Fowler, by extensive experiments, has proved it to be a *powerful diuretick*, in cases of dropsies and dysuries. He

prescribed it in the form of infusion; about eighty drops of which he considers as the average dose for an adult, or to begin with sixty drops, and increase the number by five, eight, or ten at a time, to one hundred; or till by their obvious effects on the system, the proper dose shall be ascertained. The properest times for administering the medicine, are two hours before dinner, and at bed time; it being observed to disagree the most with the stomach, in the morning fasting.

In cases of nephritis calculosa, or gravel, the infusion was given with astonishing effect. In many cases of asthma Dr. Fowler found the infusion to prove a good expectorant, and to afford great relief. The decoction of tobacco exhibited in cases of colick, procured relief almost instantaneously after other medicines had proved ineffectual. One ounce of the infusion, in half a pint of milk or gruel, is a medium dose in the form of injection for an adult of an ordinary constitution: this is to be repeated, or the strength of it increased, as occasion may require.

In the *iliack passion*, and in *hernia*, both the infusion and smoke of tobacco have been employed in the form of injection with the happiest effects. In *tympanites intestinalis*, strong clysters of tobacco infusion have greatly relieved the patients. As a vermifuge, it is deserving of being held in high repute, either taken internally, or, according to professor Barton, the leaves are to be pounded with vinegar, and applied in the shape of a poultice to the region of the stomach, or other part of the abdomen.

In consequence of this application, worms are often discharged, after powerful anthelminticks have been exhibited internally in vain.

In cases of obstinate constipation of the abdominal viscera, the infusion of this medicine has been administered, and often with immediate relief, by occasioning a speedy expulsion of the obstructed indurated feces. In the tetanus, or lock jaw, injections of this infusion have been used with success; they not only produce evacuations from the bowels, which are generally obstinately constipated, but from their antispasmodick powers, occasion a relaxation of the violent spasms so peculiar in this disease. Dr. James Currie, of Liverpool, has employed with remarkable success, a cataplasm formed chiefly of tobacco, applied to the scrobiculus cordis, about half an hour before the expected accession of the paroxysm, both in epilepsy, and in obstinate intermittents; and in two

cases of general convulsion, by means of the decoction in the form of enema, he performed cures altogether surprising and unexpected. Some precaution, however, is requisite in the use of this active article; an infusion of one drachm of the leaves, injected into the intestines, has been known to produce fatal effects. Half a drachm of the leaves, infused in a pint of water, is the quantity not to be exceeded at one time.

Nitras.

Nitrate is the generick term for secondary compounds which consist of nitrick acid, combined with any base.

There are three families of nitrates.

1. Alkaline nitrates;—soluble in water; solubility increased by increase of temperature; crystallizable; forming no precipitate with alkaline carbonates.

2. Earthy nitrates; soluble in water; forming a white precipitate with alkaline carbonates.

3. Metallick nitrates; generally soluble, both in water and in alcohol; decomposable by heat, furnishing nitrick oxide gas, and leaving the metal oxidized to a maximum.

Nitras Potassæ. *Nitrate of Potass. Nitre.* Salt Petre.

This salt, consisting of nitrick acid and potass, is found ready formed on the surface of the soil in warm climates. In the south of Europe, its production is accelerated by artificial arrangements. Animal and vegetable substances, in a state of decomposition, are mixed with a quantity of carbonate of lime, and exposed to the air, but protected from the rain. After a certain period, the materials are found to contain nitrate of lime and nitrate of potass. These salts are extracted by lixiviation with water; potass is added, by which the nitrate of lime is decomposed, and the quantity of nitrate of potash increased; and this salt is purified by repeated solutions and crystallizations. It is also found in several parts of the United States.

During the process by which the nitrate of potass is formed, it appears that the azot of the animal matter combines partly with the oxygen of the atmospherick air, and partly with the oxygen of the animal substances. The resulting compound, the nitrick acid, is attracted in part by the lime present, and in part by a quantity of potass, which seems to be likewise formed during the process.

Nitre is of a sharp, bitterish, penetrating taste, followed by a sensation of coldness. When pure, it dissolves in about six times it weight of water, and on evaporating the latter concretes into transparent crystals. It easily melts in the fire, where it deflagrates with a bright flame, accompanied with a crackling noise, and afterwards deposits a large portion of alkaline earth.

Purified nitre is prescribed with advantage in numerous disorders. Its virtues are those of a refrigerant and diuretick. It is usually given in doses from two or three grains to a scruple, being a very cooling and resolvent medicine, which, by relaxing the spasmodick rigidity of the vessels, promotes not only the secretion of urine, but at the same time insensible perspiration, in febrile disorders; while it allays thirst and abates heat; though in malignant cases in which the pulse is low, and the patients strength exhausted, it produces contrary effects.

When combined with the Peruvian bark, nitre affords a useful corrective to that drug, in the cure of spreading gangrenes; as it prevents the additional heat which the bark frequently occasions: so that the efficacy of the latter is increased by the antiseptick quality of the former. But this cooling salt should never be administered in cases where the violence of the fever depends on bilious or putrid impurities in the abdomen, and where the patient is subject to hæmorrhagies or fluxes of blood, arising from a vitiated state of the fluids. On the contrary, salt petre will be most beneficially used in acute rheumatisms, inflammatory fevers, and even in those hæmorrhagies arising from congestions of the blood in general, or from a plethorick state.

This powerful salt, when inadvertently taken in too large quantities, is one of the most fatal poisons. There are several attested cases on record, and some recent instances might be added, in which from half to a whole ounce of salt petre has occasioned violent vomiting, convulsions, swelling, and other painful symptoms, in persons who, by mistake, had swallowed it in a dissolved state, instead of glauber, or similar salts. The most proper antidote in such distressing situations, will be a scruple or half a drachm of ipecacuanha, with a teacupful of sweet oil, and a large quantity of warm water to be drunk after it, to promote its operation, as an emetick. It will be necessary also to make use of copious and frequent draughts of mucilaginous decoctions, of marsh mallows, pearl bar-

ley, arrow root, &c. after which a gentle opiate will afford the desired relief. For some interesting observations relative to the deleterious properties of salt petre, the reader is referred to Dr. Mitchell's letter to Dr. Priestley.*

Olea Europæa. *The Olive Tree.* The fixed oil of the fruit, called olive oil.

The olive tree is a native of the southern parts of Europe, especially Italy, Spain, France and Portugal, where it is cultivated to a very considerable extent, on account of its fruit, from which the sweet or salad oil is extracted; and which also, when pickled, forms an article of food. Olives possess, in their natural state, an acrid, bitter, and extremely disagreeable taste; which, however, is considerably improved when this fruit is pickled. On account of the great quantity of oil they contain, olives, if eaten by persons of delicate habits, are extremely hurtful, especially if taken by way of dessert, after a solid or heavy dinner. As an article of food, olive oil is preferable to animal fat; but it ought always to be mild, fresh, and of a sweet taste. It should not, however, be eaten by persons of weak stomach; for even in its mildest state, it produces rancidity and acrimony, which are extremely injurious to digestion.

Medicinally considered, olive oil has lately been found an excellent preventive of the plague, when rubbed over the whole body, immediately after the contagion is supposed to have taken place. The oil, when properly applied, and followed by a considerable degree of friction, occasioned a copious sweat over the whole body, by which, it is said, the patients were immediately cured.

Olive oil has also been employed with success as an antidote against the poison occasioned by the bite of serpents, especially that of the rattlesnake. In several cases apparently desperate, when a few spoonfuls of oil had been swallowed, the violent symptoms instantaneously subsided, and cures were soon effected. In gouty patients, sweet oil rubbed into the pained limb, proves a very soothing, safe, and useful application. It is also beneficially employed internally for recent colds, coughs, hoarseness, &c. and as a gentle laxative, it is sometimes given in cases of worms. It is also directed in large

* Med. Repos. vol. 3, p. 14.

quantities to mitigate the action of acrid substances taken into the stomach. Externally it is used in frictions, in gargles, and in clysters; but its principal use is for the composition of ointments and plasters.

ORCHIS MASCULA. *Salop.*

The root of this plant, by maceration in water and beating, affords the fecula known by the name of salop. Its qualities and virtues are similar to those of sago. Both of these when boiled in milk or water, with the addition of sugar and wine, form a nutritious jelly, prescribed in diarrhœa and dysentery as a demulcent, and in convalescence as a nutritious article of diet easy of digestion.

Dr. Cutler describes one species of orchis, the production of our own soil, thus,

LADY'S PLUME. *Female-handed Orchis.* Blossoms in large spikes; white or purplish, or flesh coloured. In wet meadows. August.

OSMUNDA REGALIS. *Osmond Royal. Flowering Fern.* The root.

An indigenous handsome fern growing in watery places and boggy marshes. The leaves are doubly winged, and bear bunches of flowers at the ends. The root of osmond royal abounds in a rich mucilaginous substance; when fresh from the earth, water or milk may be thickened to the consistence of syrup by the mucilage found in the interstices of the roots. This mucilage is of a quality well calculated to defend the internal parts against the irritating effects of acrimonious humours. Thus in some consumptive cases the greatest advantages have been derived from its use, and it is even reputed to have performed cures in some instances. The roots are to be infused in milk, and this should be recommended as the principal food and nutriment of the patient. On account of their soft mucilage the roots will be found highly useful as an external application to parts contused or bruised, being an excellent discutient. This domestick article merits attention and a place in the materia medica.

OSTREA EDULIS. *Oyster.* The shells.

These shell-fish cast their spawn in the month of May, when they become subject to a periodical affection; the

male fish, having a black substance in the fin, is black-sick; and the female oyster, from a milky juice in its fin, is said to be white-sick: in June and July they begin to recover, and are in August perfectly sound. They are saltish in the pits, more saline in the beds or layers, and very salt in the sea.

Oysters are esteemed as excellent food, and are eaten both raw, and dressed, in various ways: in a fresh state, however, they are doubtless preferable; for, by cooking, they are in a great measure deprived of their nourishing jelly, and of the salt water which promotes their digestion in the stomach.

The shells of the oyster are composed like all the mother-of-pearl shells, of alternate layers of carbonate of lime, and a thin membranaceous substance, which exactly resembles coagulated albumen, in all its properties. By burning, the membrane is destroyed, and they are converted into lime, which, although very pure, possesses no advantage over that of the mineral kingdom.

Ovis Aries. *The Sheep.* The fat, called mutton suet.

Mutton suet is officinal, for the purpose of giving consistency to ointments and plasters.

Oxalis Acetosella. *Wood Sorrel.* The leaves.

This is a small perennial plant, growing wild in woods, and shady hedges. The leaves contain a considerable quantity of super-oxalate of potass, and have an extremely pleasant acid taste. They possess the same powers with the vegetable acids in general, and an infusion of them makes a very palatable diet drink in ardent fevers; and on being boiled in milk, they form an agreeable whey. But the most easy and efficacious way of preserving these leaves is that of converting them into a conserve with the addition of double their weight of sugar; in which form they are an excellent substitute for lemons, and may be given with advantage in all putrid and other fevers, where antiseptics are indicated.

The leaves of wood sorrel simply bruised, have been applied to scrofulous ulcers with excellent effect, promoting suppuration and granulation in the most satisfactory manner.

The super-oxalate of potass is extracted in large quantities from the leaves of this plant, and sold under the name of *essential salt of lemons.*

Oxidum Arsenici. *Oxide of Arsenick.*

Arsenick is a heavy, opaque, crystalline substance, of a very singular nature, contained in greater or less quantity in the ore of most metalline bodies, particularly in those of tin and bismuth, and in the mineral, called *cobalt*, from which last most of the *arsenick* brought to us, is extracted in Saxony, by a kind of sublimation. It is in a white crystalline, brilliant, transparent mass, but soon becoming opaque, yet without losing its whiteness. Its true nature is so little known, that chemists have hesitated whether it ought to be ranked among the salts or semi-metals; because it may, by various processes, be made to assume either a saline or metallick state. It is very volatile, and easily oxidated. By oxidation, it is converted into a white powder, which has been considered as an oxide, and lately, perhaps more justly, as an imperfect acid.

Oxide of Arsenick is one of the most sudden and violent poisons we are acquainted with. In mines, it causes the destruction of numbers who explore them; and it is frequently the instrument by which victims are sacrificed, either by the hand of wickedness, or imprudence.

The fumes of arsenick are so deleterious to the lungs, that the artist ought to be on his guard, to prevent their being inhaled by the mouth; for if they be mixed and swallowed with the saliva, effects will take place similar to those which follow its introduction into the stomach in a saline state; namely, a sensation of a piercing, gnawing, and burning kind, accompanied with an acute pain in the stomach and intestines, which last are violently contorted; convulsive vomiting; insatiable thirst, from the parched and rough state of the tongue and throat; hiccough, palpitation of the heart, and a deadly oppression of the whole breast, succeed next; the matters ejected by the mouth, as well as the stools, exhibit a black, fœtid, and putrid appearance; at length, with the mortification of the bowels, the pain subsides, and death terminates the sufferings of the patient. Soon after death, livid spots appear on the surface of the body, the nails become blue, and often fall off along with the hair, and the whole body becomes

very speedily putrid. When the quantity is so very small as not to prove fatal, tremours, paralysis, and lingering hecticks succeed.

On dissection, the stomach and bowels are found to be inflamed, gangrenous, and corroded, and the blood is fluid.

The antidotes which have been recommended to the poison of arsenick, are various. Vomiting must be immediately excited by giving some brisk emeticks, as half a drachm of white vitriol, and after it, plenty of sweet, linseed, or almond oil; large draughts of milk, barley gruel, or warmed beer with a third part of oil, or fresh butter, should be taken.

Mr. Navier prescribes one drachm of sulphurate of potass (liver of sulphur,) to be dissolved in a pint of water, which the patient is to drink at several draughts. The sulphur unites with the arsenick and destroys its causticity and effects. According to Hehneman, a solution of white soap is the best remedy. One pound of soap may be dissolved in four pounds of hot water, and a cup full of this solution may be drunk lukewarm every three or four minutes, that the patient may swallow several pounds in the course of two hours. To promote the evacuation of the poison by stool, clysters composed of the preceding liquids, and a third part of castor oil, ought to be speedily administered, and the whole abdomen fomented with soap water.

Though the most violent of mineral poisons, arsenick, according to Murray, equals, when properly administered, the first medicines in the class of tonicks. This is well displayed in its efficacy in the treatment of intermittent fever, the disease in which it has been principally used. The employment of oxide of arsenick is now extended to remitting fever, periodical headache, dropsy, hydrophobia, lepra, elephantiasis, and certainly with safety and success, though its administration will always require to be conducted with the utmost care.

It is employed medicinally under various forms; the arsenical solution introduced by Dr. Fowler, being in general preferred, will be found in its place under the head of preparations.

In the diseases mentioned above, particularly intermittents, it has been found to be a safe and efficacious remedy, by Drs. Fowler, Withering, and other respectable practitioners.

A preparation similar to that directed by Dr. Fowler,

and called the white tasteless *ague drops*, has lately been given with singular efficacy in the hooping cough.

The celebrated professor Barton observes, that he has for several years employed the oxide of arsenick in substance, in preference to Dr. Fowler's solution. He commonly gives it in combination with opium. One grain of the arsenick is united to four or eight grains of the opium, and made into a mass with conserve of roses, or honey. This is divided into sixteen pills, of which an adult patient is to take two or three at different periods in the course of the day and night, *especially during the apyrexia*, in intermittent fevers.

Such are the powers of this medicine, that two grains of it are often sufficient to cure an intermittent, that has continued for weeks! For children, he directs that the arsenick be rubbed with honey, and molasses and water, and sometimes with a portion of gum arabick. In this form it is very conveniently given to children by drops; and the quantity of mineral, in each dose, may be estimated with considerable accuracy.

The employment of arsenick has recently been considerably extended. Since Dr. Fowler, Drs. Bardsley, and Rellie, Mr. Jenkinson, and Mr. Hill, have published their observations relative to its efficacy in various diseases. Mr. Jenkinson has experienced its utility in various painful affections of the bones, especially in cases of long standing, attended with great debility and local affections of the ends of the bones, and parts pertaining to the joints. With the view of obviating ill consequences from the use of arsenick, Dr. Rellie and Mr. Hill recommend, in strong terms, evacuations from the alimentary canal, previous to its administration. Dr. R. has judiciously pointed out the precautions to be observed in the exhibition of this active medicine, regulating the dose so as to produce the full effect without danger of injury. He directs arsenick to be given immediately after meals, conceiving that it is less apt to affect the stomach when full than when empty. He has little apprehension of risk in a guarded and judicious use of the arsenical solution. Commencing with the smallest doses, and increasing until a peculiar sensation of swelling and stiffness about the eyes and face, heat, soreness, and itching of the tarsi, or tenderness of the mouth, evince that the medicine is exerting its specifick effects on the constitution, when it is time to decrease the dose, and carefully watch its future

effects. Should erythema or salivation occur, or pain of the stomach, nausea, or vomiting supervene ; if the head be affected with pain or vertigo, or should a cough, with any signs of irritation of the pulmonary organs, be observed, the use of arsenick should be totally and for ever abandoned. Drs. Ferriar and Thomas recommend the arsenical solution with much confidence to rouse the powers of life in the last stage of typhus ; and in hooping cough, after emeticks and blisters, according to Dr. F., it should be highly commended. Dr. N. Miller, of Franklin, Massachusetts, and some other practitioners in the United States, have effected radical cures of tetanus, from wounds, by the use of Fowler's arsenical solution. Ten drops combined with an equal quantity of laudanum, are given every half hour, until relief is obtained ; after which the doses are diminished, and the medicine gradually discontinued.

As an external remedy, arsenick has long been known as the basis of the most celebrated *cancer powders ;* and it has frequently been resorted to in various forms, with the view of correcting the intolerable fœtor attending cancerous and other foul ulcers, with great success. Arneman recommends an ointment of one drachm of arsenious acid, (oxide of arsenick) the same quantity of sulphur, an ounce of distilled vinegar, and an ounce of white oxide of lead, in cancerous, obstinate, ill conditioned sores, and in suppurated scrofulous glands. Le Febure washed cancerous sores frequently in the course of the day, with a solution of four grains of oxide of arsenick in two pounds of water.

Arsenick has even been applied in substance, sprinkled upon the ulcer ; but this mode of using it is excessively painful, and extremely dangerous. There have been fatal effects produced from its absorption.

The principal thing to be attended to in arsenical applications, is to diminish their activity to a certain degree. They then cause little irritation or pain ; but rather excite a gentle degree of inflammation, which causes the diseased parts to slough off; and it has the peculiar advantage of not extending its operation laterally.

No other escharotick possesses equal powers in cancerous affections ; it not unfrequently amends the discharge, causes the sore to contract in size, and cases have been related of its having effected a cure.

Mr. Morvealt, it is said, has brought arsenick to the

state of a true neutral salt, readily soluble in water, by mixing it with equal quantities of nitre, and then submitting them to a chemical process. Mr. Milner, of Cambridge, England, has also produced an arsenical salt of the same nature, which has been employed with the greatest success in that neighbourhood by several practitioners.

The red and yellow arsenicks, both native and factitious, have little taste, and are much less virulent in their effects than the white arsenick. Sulphur, which restrains the power of mercury and the antimonial metal, remarkably abates the virulence of this poisonous mineral also. Such of these substances as participate more largely of sulphur, seem to be almost innocent: the factitious red arsenick, and the native orpiments, have been given to dogs in considerable quantity, without being productive of any apparent ill consequences.

Oxidum Plumbi Album. *White Oxide of Lead. Cerusse.*

The white oxide of lead is manufactured in several countries; it is prepared by exposing lead to the vapour of vinegar. To accelerate the oxidizement, the lead is cast into thin plates, which are suspended over a vessel containing vinegar, in a moderately warm place, that the vapour arising from the acid may circulate freely round the plates: a white powder settles in the course of two or three weeks on the surface of the metal, which is in due time removed; and the remains of the plates again exposed to the vapour of vinegar, until they be entirely corroded, and converted into a white calx, when it is called *cerusse*, or white lead.

White oxide of lead is used in surgery; and on account of its cooling, drying, and astringent properties, is of considerable service when sprinkled over running sores, and ulcers. In pharmacy it is used only in the composition of ointments and plasters.

Oxidum Plumbi Rubrum. *Red Oxide of Lead.* Red Lead.

The preparation of red lead is so troublesome and tedious, as scarcely ever to be attempted by the apothecary or chemist. The makers melt large quantities of lead at once, upon the bottom of a reverberatory furnace built

for this purpose, and so contrived, that the flame acts upon a large surface of the metal, which is continually changed by the means of iron rakes drawn backwards and forwards, till the fluidity of the lead be destroyed; after which the oxide is only now and then turned.

The red oxide of lead is obtained in the form of a very heavy powder, consisting of minute shining scales, of a bright scarlet, verging towards yellow, especially if triturated.

In medicine, red lead is only employed externally; it obtunds the acrimony of humours; mitigates inflammations; and if judiciously applied, is of excellent service in cleansing and healing old ulcers.

Oxidum Plumbi Semivitreum. *Semi-vitrified Oxide of Lead.* Litharge.

If oxidized lead be urged with a hasty fire, it melts into the appearance of oil, and on cooling concretes into litharge. Greatest part of the litharge met with in the shops, is produced in the purification of silver from lead, and the refining of gold and silver by means of this metal. According to the degree of fire and other circumstances, it proves of a pale or deep colour: the first has been commonly called litharge of silver, the other litharge of gold.

The oxides of lead dissolve by heat, in expressed oils; these mixtures are the bases of several officinal plasters and ointments. Lead and its oxides, when undissolved, have no considerable effects as medicines. Dissolved in oils, they are supposed to be (when externally applied) anti-inflammatory and desiccative. Combined with vegetable acids they are remarkably so; and taken internally, prove powerful though dangerous stypticks.

Oxidum Zinci Impurum. *Impure Oxide of Zinc.* *Tutty.*

It is moderately hard and ponderous; of a brownish colour, and full of small protuberances on the out side, smooth and yellowish within; some pieces have a blueish cast, from minute globules of zinc in its metallick form.

Tutty is celebrated as an ophthalmick, and frequently employed as such in unguents and collyria.

PAPAVER SOMNIFERUM. *White Poppy.* The capsules and their inspissated juice, called opium.

The white poppy is an annual plant, and is sometimes found wild in Great Britain; but it is probably originally a native of the warmer parts of Asia. The leaves, stalks, and capsules, of the poppy, abound with milky juice, which may be collected in considerable quantity, by slightly wounding them when almost ripe. This juice, exposed for a few days to the sun and air, thickens into a stiff tenacious mass, which in fact is opium. It is then worked up into masses, and covered with poppy or tobacco leaves.

A strong decoction of the dried heads, mixed with as much sugar as is sufficient to reduce it to the consistence of a syrup, becomes fit for keeping in a liquid form. It is, however, a very unequal preparation, as the real quantity of opium it contains is very uncertain, and by no means equal to syrup, to which a certain quantity of solution of opium is added. The seeds of the poppy are simply emulsive, and contain none of the narcotick principle. They yield a considerable quantity of oil by expression.

Two kinds of opium are found in commerce, distinguished by the names of Turkey, and East India opium.

Turkey opium is a solid compact substance, possessing a considerable degree of tenacity; when broken, having a shining fracture and uniform appearance; of a dark brown colour, and becoming yellow when reduced to powder; scarcely colouring the saliva when chewed, exciting at first a nauseous bitter taste, which soon becomes acrid, with some degree of warmth; and having a peculiar, heavy, disagreeable smell. The best is in flat pieces, and besides the large leaves in which it is enveloped, is covered with the reddish capsules of a species of rumex, probably used in packing it. The round masses which have none of these capsules adhering to them, are evidently inferiour in quality. It is bad if it be soft, friable, mixed with any impurities, or have an intensely dark or blackish colour.

East India opium has much less consistence, being sometimes not much thicker than tar, and always ductile. Its colour is much darker; its taste more nauseous, and less bitter; and its smell rather empyreumatick. It is consi-

derably cheaper than Turkish opium, and supposed to be of only half the strength.

Opium is supposed to consist principally of gum and resin, in the proportions of about four and a half of each in twelve parts of the crude opium. The bitterness is said to reside in the gum; the astringency, flavour, and narcotick quality in the resin. It affords a volatile principle; water distilled from it having its nauseous taste and smell, but none of its narcotick quality. It contains also some saline matter, and a substance insoluble either in alcohol or water.

From its analysis may be estimated the effects of different solvents upon it. Alcohol and proof spirit, dissolving its resin, affords tinctures possessing all its virtues. Water dissolves its gummy part, which is much less active, but a part of the resin is at the same time taken up by the medium of the gum. Wines also afford solutions possessing the virtues of opium. Vinegar dissolves its active matter, but greatly impairs its power.

The attempts made by some pharmaceutists, to obtain a preparation of opium, which should possess only its sedative, without its narcotick effects, only succeeded in so far as they diminished its activity.

The action of opium on the living system, has been the subject of the keenest controversy. Some have asserted that it is a direct sedative, while others have asserted as strongly that it is a powerful stimulus, and that the sedative effects, which it certainly produces, depend entirely on the previous excitement. We cannot here pretend to give even an abstract of the arguments used by the supporters of each opinion. We regret still more, that the contradictory results of their experiments render it difficult to ascertain even its primary and visible effects.

Opium, when taken into the stomach to such an extent as to have any sensible effect, gives rise to a pleasant serenity of mind, in general proceeding to a certain degree of langour and drowsiness. The action of the sanguiferous system is diminished, the pulse becoming for the most part softer, fuller, and slower than it was before.

By many, on the contrary, it is said, in the first instance at least, to increase the frequency of the pulse, and the heat of the body. It diminishes all the secretions and excretions, except the cuticular discharge, which it fre-

quently augments in a very sensible degree. It excites thirst, and renders the mouth dry and parched.

Opium taken into the stomach in a larger dose, gives rise to confusion of head and vertigo. The powers of all stimulating causes of making impressions on the body are diminished; and even at times, and in situations, when a person would naturally be awake, sleep is irresistibly induced. In still larger doses, it acts in the same manner as the narcotick poisons, giving rise to vertigo, headache, tremours, delirium, and convulsions; and these terminating in a state of stupor, from which the person cannot be roused. This stupor is accompanied with slowness of the pulse, and with stertor in breathing, and the scene is terminated in death, attended with the same appearances as take place in an apoplexy.

From these effects of opium in a state of health, it is not wonderful that recourse should have been had to it in disease, as mitigating pain, inducing sleep, allaying inordinate action, and diminishing morbid sensibility. That these effects result from it, is confirmed by the daily experience of every observer; and as answering one or other of these intentions, most, if not all, of the good consequences derived from it in actual practice are to be explained. If, therefore, by a sedative medicine, we mean an article capable of allaying, assuaging, mitigating, and composing, no substance can have a better title to the appellation of sedative than opium.

Some practitioners are averse to its use in active inflammation; but others have recourse to it in such cases, even at an early period, especially after blood-letting; and where such affections are attended not only with pain and spasms, but with watchfulness and cough, it is often productive of the greatest benefit. Opium combined with calomel has of late been extensively employed in every form of active inflammation, and with the greatest success. It is found also to be of very great service in allaying the pain and preventing the symptomatick fever liable to be induced by wounds, fractures, burns, or similar accidents.

In intermittents, it is said to have been used with good effect before the fit in the cold stage, in the hot stage, and during the interval. Given even in the hot stage, it has been observed to allay the heat, thirst, headache, and delirium, to induce sweat and sleep, to cure the disease

with less bark, and without leaving abdominal obstructions or dropsy.

It is often of very great service in fevers of the typhoid type, when patients are distressed with watchfulness or diarrhœa. But where these or similar circumstances do not indicate its use, it is often distressing to patients by augmenting thirst and constipation.

In small pox, when the convulsions before eruption are frequent and considerable, opium is liberally used. It is likewise given from the fifth day onwards; and is found to allay the pain of suppuration, to promote the ptyalism, and to be otherwise useful.

In dysentery, after the use of gentle laxatives, or along with them, opium, independent of any effect it may have on the fever, is of consequence in allaying the tormina and tenesmus, and in obviating that laxity of bowels which so frequently remains after that disease.

In diarrhœa, the disease itself generally carries off any acrimony that may be a cause, and then opium is used with great effect. Even in the worst symptomatick cases, it seldom fails to alleviate.

In cholera and pyrosis, it is almost the only thing trusted to.

In colick, it is employed with laxatives; and no doubt often prevents ileus and inflammation, by relieving the spasm. Even in ileus and incarcerated hernia, it is often found to allay the vomiting, the spasms, the pain, and sometimes to diminish the inflammation, and prevent the gangrene of the strangulated gut.

It is given to allay the pain and favour the descent of calculi, and to relieve in jaundice and dysuria proceeding from spasm.

It is of acknowledged use in the different species of tetanus; affords relief to the various spasmodick symptoms of dyspepsia, hysteria, hypochondriasis, asthma, rabies canina, &c. and has been found useful in some kinds of epilepsy.

In syphilis it is only useful in combating symptoms, and in counteracting the effects resulting from the improper use of mercury, for it possesses no power of overcoming the venereal virus.

It is found useful in certain cases of threatened abortion and lingering delivery, in convulsions during parturition, and in the after pains and excessive flooding.

The only form perhaps necessary for opium is that of pill; and as it is so soluble in every menstruum, there seems the less occasion for the addition of either gum or soap. It is more apt to sit on the stomach in this than any liquid form, but requires rather more time to produce its effects. The administration of opium to the unaccustomed, is sometimes very difficult. The requisite quantity of opium is wonderfully different in different persons, and in different states of the same person. A quarter of a grain will in one adult produce effects which ten times the quantity will not do in another; and a dose that might prove fatal in cholera or colick, would not be perceptible in many cases of tetanus or mania. The lowest fatal dose to the unaccustomed as mentioned by authors, seems to be four grains; but a dangerous dose is so apt to puke, that it has seldom time to occasion death. When given in too small a dose, it is apt to produce disturbed sleep, and other disagreeable consequences; and with some constitutions it seems not to agree in any dose or form. Often, on the other hand, from a small dose, sound sleep, and alleviation of pain will be produced, while a larger one gives rise to vertigo and delirium. Some prefer the repetition of small doses, others the giving of a full dose at once. In some it seems not to have its proper effect till after a considerable time. The soporifick operation of a moderate dose is supposed to last in general about eight hours from the time of taking it.

It is often given to promote healthy suppuration, and is a principal remedy in arresting the progress of certain kinds of gangrene.

Externally applied, opium alleviates pain, and relieves spasmodick action. Hence the utility of it in colick, tetanus, toothache, &c. In the form of enema, it is of singular efficacy in tenesmus, and it is employed under the same form in other diseases, where its administration by the mouth is inconvenient or impracticable.

In his medical reports on the effect of water, Dr. James Currie relates a case of tetanus, and general convulsion, in which the patient first took a grain of opium every other hour; afterwards a grain every hour, and at last two grains every hour. But being no longer able to swallow pills, the tincture (liquid laudanum) was directed, of which in twenty-four hours he took two and a half ounces without sleep or alleviation of pain. The dose being increased in the next twenty-six hours, he swal-

lowed five and a half ounces of the laudanum, a quantity, which at that time, says the doctor, was unexampled. He lay now in a state of torpor. The rigidity of the spasms was indeed much lessened; and the general convulsions nearly gone; but the debility was extreme; a complete hemiplegia had supervened; the patient's eyes were fixed, and his speech faltering and unintelligible. It seemed no longer safe to continue the laudanum, and the patient was afterwards cured by the cold bath and other remedies.

Dr. Joshua Fisher, in his interesting discourse read before the Massachusetts medical society, asserts, that a young lady aged seventeen, being seized with excruciating spasms, the consequence of a rupture of the sartorious muscle, took twelve grains of opium every ten minutes till she had taken seventy-two grains. This quantity removed the spasms, produced a comatose insensibility, slow, stertorous breathing, and a slow full pulse. In eight hours the spasms returned, and the opium was given as before. In this manner the opium was repeated at intervals of eight hours, for three days, when the spasms ceased, and she recovered. During this period of three days, she took nearly eleven drachms of excellent opium, and not a grain more than was absolutely necessary.

In the colica pictonum, or Devonshire colick, Dr. Fisher administers opium in doses from fifteen to forty grains; and has not for many years past, seen a single case of this distressing disease, which has not yielded to its efficacy in about an hour.

This experienced physician has prescribed opium in large doses, in cases of cholera, with equal success. A gentleman, of about sixty-five years, was seized with this disease in so violent a manner, that, in a few hours after the attack, every symptom indicated his speedy dissolution. As soon as practicable, sixty grains of opium were given, ten of which were returned by vomiting. The quantity retained, soon removed every distressing symptom: gradually and with difficulty he recovered his strength.

The soporifick effects of opium may be checked, if a proper quantity of the vegetable acid be taken with, or immediately after it. Thus, if one ounce of pure lemon juice, or twice that quantity of good vinegar, be added to every grain of opium, or to twenty-five drops of lauda-

num, such a compound will produce a very different effect. Instead of stupifying the head, and producing troublesome costiveness, it will not only relieve the bowels, but also occasion a degree of cheerfulness, never attainable by the use of opium alone, and afterwards induce a composed and refreshing sleep.

It is a melancholy consideration, that this excellent, kind assuager of our bodily pains and mental distress, is frequently resorted to for the horrid purpose of self-destruction. The alarming symptoms induced by it, are, vomiting, delirium, stupor, deep and difficult breathing, convulsions, and death. The remedies are in the first instance, powerful emeticks of sulphate of zinc, twenty grains of which should be given immediately, in a glass of warm water, and repeated every ten minutes, until copious vomitings are excited. Warm water is then to be freely given, together with a smart purgative of rhubarb or jalap, joined with a few grains of potass. These should be succeeded with water-gruel or butter-milk, sour whey, and particularly the vegetable acids, or strong coffee, which last appears to be the most effectual antidote.

The principal object to be kept in view, according to Dr. Seaman, of New York, is, to produce such a degree of irritation, as may counteract the narcotick effects of this deleterious drug. Hence it is very useful to stimulate the nostrils with spirits of hartshorn, and to apply friction with salt over the whole body. When the symptoms of apoplexy have come on, the remedy is *copious bleeding*. This has been used in four cases by Dr. Rush, who remarks, that it should never be prescribed, until great morbid action, or the suffocation of action from the excess of stimulus, (manifested chiefly in the depressed state of the pulse,) have taken place.*

* The following interesting articles are taken from Murray's materia medica, being a note by the editor, professor Chapman, of Philadelphia.

" The quantity of laudanum which has sometimes been taken, would be incredible, if the fact were not attested by indisputable authority. I knew in one case, a wine glassful of it to be given, several times in the twenty-four hours, for many months in succession, to alleviate the pain from the passage of biliary calculi.

" In a case of cancer of the uterus, which was under the care of two highly respectable physicians of this city, Drs. Monges and La Roche, the quantity was gradually increased to three pints of

PHYSETER MACROCEPHALUS. *Spermaceti Whale.* The matter found within the cranium, called spermaceti.

Spermaceti is a fatty matter, obtained from the head of the particular species of whale abovementioned. It is purified by melting and boiling with an alkaline solution. It is then in white flakes, is unctuous and friable, and has neither taste nor smell. Its chemical properties are the same as those of the expressed oils and fats, except that it does not easily unite with the alkalis.

Its medicinal virtues are those of a mild demulcent, and as such is given in catarrh and gonorrhœa, mixed with sugar, or diffused in water by the medium of the yolk of an egg.

laudanum, besides a considerable portion of opium, in the twenty-four hours."

There are "two preparations under the denomination of the *black drop*, which are much used in the popular practice, and have acquired some reputation among the physicians of this city. Of my own knowledge, I can say little of this medicine. I have occasionally prescribed it, and I am inclined to believe not without advantage, in cases to which laudanum did not seem to be well suited. It is however alleged, by those whose experience with it is more enlarged, that it is never productive of headache, giddiness, nausea, and the rest of the distressing narcotick effects of opium and its ordinary preparations. The formula are as follows:

1. Take of purified opium, five ounces.
   Pimento and cinnamon, two drachms.
   Saffron and orangepeel, of each one drachm.
   Spirit of wine rectified, one pint.

"Digest a week, and strain the liquor through flannel, to which is to be added sugar candy enough to make it pleasantly sweet.

2. Take of opium, four ounces,
   Sharp vinegar, or lemon juice, four pints.

"Digest three weeks, and then add saffron, cloves, nutmegs, and cinnamon, of each an ounce, coarsely powdered. Continue the digestion a week longer, strain through flannel, and evaporate the liquor reduced to the consistence of syrup. The dose of these preparations is about a half of that of laudanum, and it is the latter of them which is chiefly employed in Philadelphia. Neither the one nor the other is a new medicine, as similar receipts are to be found in the old writers."

PHYTOLACCA DECANDRA. *Poke. Garget.* The leaves, berries, and root.

This is one of the most common American plants, occupying waste land, by the side of fences, or near the road, throughout the United States. It is well known in New England by the various names of poke, garget, jalap, pigeon berry, and cocum; this last is probably an abbreviation of kokokum, the Indian name for the crow. In Europe it is called American night shade. It has a thick fleshy perennial root, sometimes as large as a man's thigh. From this annually arise many branches of a purplish colour, irregularly set, with large oval sharp pointed leaves, supported on short foot stalks. At the joints and divisions of the branches, come forth long bunches of small flowers, of a dull white, in July and August. These are succeeded by long clusters of dark purple berries, having ten cells, each of which contain a single smooth seed. This plant is well known to possess valuable medicinal properties; and the root has recently been the subject of numerous experiments, with the view of ascertaining its powers as an emetick. In one instance twenty-four, and in another thirty grains, produced evacuations from both the stomach and bowels, with considerable severity, unattended however by unpleasant effects. But we are indebted to professor Bigelow for the most satisfactory details relative to this subject. He asserts from repeated experiments, that the root of phytolacca decandra, in its medicinal properties, approaches nearer to ipecacuanha, than any American vegetable he has hitherto examined. And from abundant experience, the result of many trials, it has been found to operate when properly prepared in the same doses, and with the same certainty as the ipecacuanha. Ten grains of the powder will rarely remain on the stomach, and twenty or thirty produce a powerful operation by emesis, and generally by catharsis. It operates with ease, and seldom occasions pain or cramp. But it is slow in its effects, frequently not beginning to operate until an hour, and sometimes two hours after it is taken. It sometimes continues to operate for a greater length of time than is usual for emeticks, though it is readily checked by an opiate. In some instances it has commenced operating in fifteen minutes, and produced only four or five ejections. Dr. Fisher of Beverly has informed Dr. Bigelow, that he has

found the phytolacca to perform its duty as an emetick, perfectly well, and that in one patient, a female of irritable stomach, in whom previous emeticks had always excited severe spasms, ten grains of this medicine operated effectually, and no spasm followed. Dr. Bigelow cites also the authority of Dr. George Hayward, of Boston, who has had much experience with this medicine, the results of which has been published in the New England journal, October, 1817. He states, that in nearly thirty cases, he administered it in doses of a scruple, in all which, one only excepted, it operated as an emetick and cathartick, usually three or four times thoroughly, though not severely, generally commencing its operation on the stomach, in an hour, and rarely continuing longer than four. He found it to excite little or no nausea, previous to its operation, and it never produced any disagreeable or unusual symptoms. Dr. H. also made trial of the powder of the leaves, and a tincture, decoction and wine of the root, but found all these inferiour to the powdered root in substance, and occasioning sometimes unpleasant effects. This medicine has in some instances, produced slight narcotick symptoms, such as vertigo, drowsiness, or stupor, and the root has been known, when incautiously eaten in large quantities, to produce violent vomiting and purging, prostration of strength, and in some instances, convulsions. But the young shoots are sometimes eaten in the spring, as substitutes for asparagus, with impunity.

Dr. Shults of Pennsylvania, in his inaugural dissertation on the phytolacca, asserts, that in many instances in which he gave the expressed juice of the leaves, berries, and roots to animals, it operated by emesis and catharsis, attended with drowsiness. The juice of the root was most active. In the treatment of rheumatick affections, phytolacca has obtained some reputation, and in syphilitick rheumatism in particular, it is said to have proved more useful than guaiacum or opium, especially when combined with mercury. But Dr. Hayward states, that in his trials he derived no advantage from its employment in rheumatick affections. This plant has been employed by various physicians as a valuable remedy in hæmorrhoides. A strong infusion of the leaves or roots is given internally, in repeated doses of half an ounce, and if it do not speedily relieve, the same infusion is to be injected into the rectum, and repeated. if necessary. Phytolacca, applied externally, has been beneficial in the treatment

of seabies, herpes, tinea capitis, psora, and various cutaneous eruptions. The ointment or extract has the effect of a local stimulant, or mild caustick, cleansing and healing vitiated and foul ulcers with much facility. In three cases of *fistula lachrimalis*, the extract is reputed to have performed cures by being applied to the part affected, twice a day, for two or three weeks. The roots have been applied with advantage, as a stimulant to the feet and wrists of patients in low fevers. The extract of this plant has sustained considerable reputation as a remedy for cancerous affections. But no well authenticated instance of radical cure of the disease by this medicine, it is believed, is to be found on medical record. The following preparation for the purpose, has been a popular nostrum in the hands of an individual. Pigeon berry root, one pound ; juice of mayweed, (anthemis cotula) two ounces; pot ash, one ounce. Boil the root in water, and strain. Add the other articles, and simmer to the consistence of extract. This mild caustick seems well adapted to the cure of callous and foul ulcers, and may have its use when applied to those of a cancerous and scrofulous nature. It is ascertained that the root of this plant possesses more active properties than the leaves or berries. It should be dug late in November, after the stalks and leaves are killed by the frost. It must then be cut transversely into thin slices, dried with a moderate heat, powdered and kept in close bottles for use. A new supply should be procured annually, as it loses its virtues by keeping. An ointment may be prepared by mixing one or two ounces of the powdered root with a pound of hog's lard, and simmering them together. With this Dr. Hayward cured the itch, where the ointment of sulphur and of mercury had no effect; and treated successfully the case of a boy who had been afflicted for twelve years with tinea capitis, and had resisted all the ordinary applications. The doctor observes, that the ointment is apt to produce, after the first or second application, a great heat and burning over the surface on which it is applied ; when this is the case it should be washed off, and it seldom occasions the same effect on a renewed application of it. The leaves should be gathered about July, when the foot stalks begin to assume a reddish colour, dried in the shade, powdered, and kept in close bottles. An extract may be obtained from the leaves

when gathered at this period, by evaporating their expressed juice to a proper consistence. A tincture may be made by dissolving either the extract or leaves in proof spirit, or in the spirit distilled from the berries. An ointment is also made by mixing the powdered leaves with hog's lard, or by simmering hog's lard with fresh leaves and straining the mass. The berries should be gathered late in autumn, when they become soft and ripe, and are of a blackish colour. These are sometimes steeped in proof spirit, and employed by the country people in chronick rheumatism. The juice from these berries afford a beautiful, but not permanent purple dye.

Professor Bigelow in his appendix observes, "It has been already stated, that the inconveniences in the emetick operation of this plant, are its slow commencement, long continuance, and occasional narcotick effect. I have since writing the article, become acquainted with instances of hypercatharsis, following the employment of this medicine in large doses." "In a few instances I have known a decided effect take place on the retina, producing blindness for two or three hours. In general it may be considered improper to give large quantities of this medicine, or to accumulate it by the repetition of small quantities. In these respects it has not the safety of the officinal ipecacuanha."

Note. In the former editions of this work, the very respectable authority of Drs. Kollock and Jones, of Savannah, was cited for the efficacy of phytolacca decandra, as an effectual remedy for syphilis, in its various stages. This errour was in consequence of a misconception of the ideas which those gentlemen intended to convey in their verbal communication, and which is now with pleasure corrected.

Pimpinella Anisum. *Anise.* The seeds.

Anise is an annual umbelliferous plant, growing naturally in Crete, Syria, and other places of the East.

The seeds of anise have an aromatick odour, and a warm taste, with a share of sweetness. They afford by distillation with water, a considerable quantity of an essential oil, having a strong flavour, and a sweet taste without pungency.

Anise is used as a good carminative in dyspepsia, and in the flatulence to which children are subject. A drachm

or two of the seeds may be taken, or a few drops of the oil rubbed with sugar.—(See volatile oils.)

PINUS ABIES. *Common Spruce Fir.* The resin which concretes spontaneously, called Burgundy pitch.

This substance is obtained by exudation, from incisions in the trunk of the tree. It is boiled with a small quantity of water; is strained; and when cold, forms a concrete resinous matter. This, spread upon leather, and applied to the skin, excites a slight degree of inflammation, and exudation of serous fluid.

In obstinate coughs, affections of the lungs, and other internal complaints, plasters of this resin, by acting as a topical stimulus, are frequently found of considerable service.

PINUS BALSAMEA. *Balsam Fir. Hemlock Fir.* The liquid resin, called balsam of Canada.

This balsam exudes spontaneously from the trunk of the tree. It is of a light yellow colour, tenacious, and inflammable. By keeping, it becomes thicker; its smell is agreeable; its taste pungent. It is soluble in alcohol and oils, and affords an essential oil by distillation.

The medicinal virtues of this balsam seem to be the same as those of copaiba, and it is used for the same purposes. Its dose is from thirty to fifty drops.

PINUS LARIX. *The Larch tree.* The liquid resin, called Venice turpentine; and volatile oil, called oil of turpentine.

This balsam exudes spontaneously, and in greater abundance from incisions in the tree. It is thick and tenacious, pellucid, of a yellowish colour, has a pleasant smell, and a bitterish, pungent taste. By distillation, with the addition of a small quantity of water, to prevent the temperature from rising too high, it affords a large quantity of essential oil (oleum terebinthinæ, oil of turpentine;) the residuum being a resin nearly insipid, (common white, or yellow resin.)

Venice turpentine derives all its virtues from its essential oil, and it is this oil that is generally used in medicine. It is a powerful stimulant, directed more particularly in its action to the urinary passages. It has been employed in gleet, and in chronick rheumatism, especially in that form of it termed sciatica and lumbago, in a dose of from ten to twenty drops, gradually increased, generally mixed with a quantity of honey, by which its pungency is covered. It is apt, however, to induce violent symptoms. Externally, it is applied as a stimulant to parts affected with cramp and rheumatism. Oil of turpentine has of late been successfully applied to scalds. When seasonably applied to the scalded part, the pain has frequently been removed in an hour, and blisters effectually prevented. The turpentine itself is sometimes used internally for the same purposes as its oil. The white resin is somewhat stimulant and diuretick; but it is only employed in the composition of ointments and plasters, which it renders more adhesive, and perhaps more stimulating. Oil of turpentine has also been found to possess styptick powers in restraining epistaxis when applied up the nostrils.

It should be observed, that the oil of turpentine in common use among us, is obtained almost exclusively from the pitch pine of the southern states, (pinus palustris.) Whether this differs in degree of strength or acrimony, from the oil afforded by the larch, has not, we believe, been ascertained.

The rectified oil of turpentine has lately been administered by Dr. J. B. Brown with complete success in the case of a lad aged sixteen years afflicted for six years with tænia. This lad swallowed the oil undiluted in a dose of one ounce, and once in a dose of one ounce and half, and took three doses in sixteen hours. It operated powerfully as a cathartick, and he discharged upwards of twenty feet of the tænia. Dr. B. is convinced that the oil of turpentine, rectified, may be given to the extent of two or three ounces with perfect safety, but prefers half ounce doses at short intervals. This practice has since been adopted by different physicians, and in general with complete success. The tape worm has in numerous instances been expelled by the efficacy of the oil of turpentine. Experience has decided that this medicine may be exhibited to the quantity of several ounces without injury. On some occasions, however, it excites a temporary heat over the body, with slight vomiting, and some affection of

the urinary passages. One instance has been reported, of a female patient, from a strong desire to destroy the tape worm, having swallowed no less than one pint of the undiluted oil in twenty-four hours; and this with the desired effect, unattended with any permanent serious consequences.

Pinus Sylvestris. *Scotch Fir.* The empyreumatick resin, called tar; and the liquid resin, called common turpentine.

Tar is a thick, black, unctuous matter, extracted from the wood of the pinus sylvestris, by combustion in a close smothering heat. By long boiling, tar is deprived of its volatile parts, and converted into pitch. Tar is a mixture of resin, empyreumatick oil, charcoal, and acetous acid. It was formerly in great repute as a medicine, both in its original state, and also in infusion with water.

It has been greatly recommended by bishop Berkley, in the murrain of cattle; and likewise in cold and phlegmatick habits of mankind; as it not only raises the pulse, and accelerates the circulation, but, at the same time, exhilarates the animal spirits. At present, however, tar water is seldom employed, though its external application proves to be an excellent remedy for the stings of wasps and bees. Tar is applied in the form of ointment, in tinea capitis, and some other cutaneous diseases.

The common turpentine obtained from this tree is rarely given internally; its principal use is in plasters and ointments among farriers, and for the distillation of essential oil.

A fluid extract, prepared by decoction from the twigs or cones of the pinus sylvestris, is the usual well known *essence of spruce*, which fermented with molasses, forms the fashionable beverage of spruce beer.

Piper Nigrum. *Black Pepper.* The root.

This tree is a native of the East Indies, where the fruit or berries, in their unripe state, are gathered in the month of October, and dried, by being exposed to the sun for seven or eight days. Its smell is aromatick: its taste pungent. Both are extracted completely by water; partially by alcohol.

Pepper, from its stimulating and aromatick qualities, is employed, to promote digestion, to relieve nausea, to check vomiting, or to remove singultus, and as a remedy in retrocedent gout and paralysis. Its dose is ten or fifteen grains. Its infusion has been used as a gargle, in relaxation of the uvula.

White pepper is the ripe berries of the same vegetable, freed from the outer covering, and dried in the sun. It is less pungent than the black.

Piper Longum. *Long Pepper.* The fruit.

This berry is obtained from another species of the same genus of trees. It is about half an inch in length, cylindrical, and indented on the surface. In flavour, taste, and other qualities, it is similar to the black pepper, and may be used for the same purposes.

Plantago. *Plantain.* The leaves.

Great plantain is perennial, common in fields and by the road sides, flowering from June to August. The country people apply the bruised leaves of this vegetable to slight wounds, and inflamed sores and swellings with a favourable effect. It has been recorded in a Virginia gazette, 1802, that a gentleman was bitten above the knee by a venomous spider. In a few minutes he observed a pain shooting upwards from the spot, which presently reached his heart. A quantity of plantain leaf was immediately procured, and the juice being bruised out was swallowed largely, by which the progress of the poison was stopt, and finally a cure was effected. Some oil was also swallowed, but the plantain leaf had the entire credit of his recovery, and but for this remedy, he said he could not have survived an hour longer.

Plumbum. *Lead.*

This is one of the imperfect metals, of a dull white, inclining to a blue colour: and, though the least ductile and sonorous, it is the heaviest of metallick bodies, excepting mercury, gold and platina. Lead is found in various countries; but it abounds in England. It is obtained by various processes, from the ores dug from the earth. In its metallick form, it is scarcely an officinal

article, and its different oxides are purchased from the manufacturers, and never prepared by the apothecary.

Its effects on the body are emaciation, violent colicks, paralysis, tremours, and contractions of the limbs; as they generally come on gradually, the cause is sometimes overlooked, until it be too late. Poisoning from lead is occasioned, either from liquors becoming impregnated with it, by being improperly kept in vessels lined with that metal, or to which lead has been criminally added to correct its acidity; or among manufacturers, who work much with lead, as painters and plumbers, and who are not sufficiently attentive to avoid swallowing it. The only effectual antidotes to this insidious poison, are antimonial emeticks; and after them, the internal use of liver of sulphur, together with vegetable oils, both internally and externally, should be liberally continued.

For the medicinal virtues of lead, see its several preparations.

PODOPHYLLUM PELTATUM. *May Apple.* The root.

The podophyllum peltatum is a common plant, growing spontaneously in low shady situations in most parts of the United States, and is sometimes called mandrake. The stem rises to about one foot in height, smooth, round and erect, dividing at top into two round petioles from three to six inches long. Each petiole supports a large palmate leaf. In the fork of the stem appears a solitary flower, on a round nodding peduncle, one or two inches long. Its flowering time is from March to May. The fruit is the size of a common plum, of a yellowish colour, esculent, and by some thought delicious. The late professor Barton asserts that the leaves are poisonous, and the whole plant has some narcotick quality. He had great confidence in the cathartick property of the root of this plant, and observed that it has been thought by some practitioners to whom he had made known the use of the medicine, to be especially adapted as a purge in cases of intermittents, remittents and dropsy. The root is the part to be employed, and should be given in fine powder in doses of twenty grains, which operate with efficacy, and without inconvenience. It is said by some to be most advantageously used in combination with calomel or crystals of tartar. Professor Bigelow says "the medicinal properties of the podophyllum peltatum are

those of a sure and active cathartick, in which character it deserves a high rank among our indigenous productions. We have hardly any native plant which answers better the common purpose of jalap, aloes, and rhubarb, and which is more safe and mild in its operation." An extract has been prepared from the root of May apple which is much esteemed by medical practitioners as a mild cathartick. The root for medicinal use should be dug in autumn when the leaves have turned yellow, and carefully dried for use. The root of this plant increases rapidly when transplanted; and physicians may furnish themselves with an excellent cathartick, with a little attention to its cultivation.

Polygala Senega. *Seneka. Rattle Snake Root.* The root.

Seneka is a perennial plant, which abounds in nearly all the United States, particularly in Virginia and Pennsylvania. This root is usually about the thickness of the little finger, variously bent, and contorted, and appears as if composed of joints, whence it is supposed to resemble the tail of the animal whose name it bears; a kind of membranous margin runs on each side, the whole length of the root.

This root was first introduced into use in 1739, by Dr. Tennent, of Virginia, who wrote a pamphlet on the subject, and highly extolled it as a remedy for many complaints, and particularly, as a specifick for the cure of the bite of the rattle-snake. It is an active stimulus, and increases the force of the circulation, especially of the pulmonary vessels. It has therefore been found useful in typhoid inflammation of the lungs, but it is apt to disorder the stomach, and to induce diarrhœa. Some have likewise employed this root in hydropick cases, and not without success.

There are examples of its occasioning a plentiful discharge by stool, urine, and perspiration; and by this means removing the disease, after the common diureticks and hydragogues had failed.

It sometimes induces salivation, and it possesses diuretick, emetick, cathartick, expectorant, and diaphoretick powers. Dr. Archer, of Maryland, discovered the great utility of seneka snake-root, as a remedy for that fatal disease, the *croup*, and speaks with confidence as to the

general good effects produced by it. The decoction of the root is the manner in which he generally gives it; the strength must be determined by the physician: it must be so strong, as to act sensibly on his own mouth and throat, in exciting coughing, &c. for in this disease, the larynx (mouth of the wind pipe) in a manner loses its natural sensibility. Half an ounce of the root of seneka, bruised, and simmered in a close vessel, in half a pint of water, until reduced to four ounces, will, probably, in most cases be sufficiently strong. A teaspoonful of this to be given every hour or half hour, as the urgency of the symptoms shall demand; and during these intervals, a few drops occasionally, to keep up a sensible action of the medicine, in the mouth and throat, until it act as an emetick and cathartick; then repeated in small quantities, and so frequently as to keep up a constant stimulus in the same. By these means, in the course of two, four, six, or eight hours, a membrane is often times discharged by the mouth, one, two, and often three inches in length; sometimes it is swallowed and voided by stool.

Patients who use the medicine should not be permitted to drink any thing whatever, for some minutes after each dose. The reason must be obvious to all. The powder has lately been used by Drs. Archer and Son, in doses of four or five grains, mixed with a little water, with effects equally as pleasing as the decoction, and more so, unless the latter have been carefully prepared. It should be remarked that this powerful stimulant cannot with safety be exhibited during the inflammatory stage of croup. It is in the third or last stage only, it has been found extremely useful in exciting the vessels of the trachea and lungs to a powerful excretion.

Seneka has been usefully employed in the decline of pleurisies and catarrhs, to promote expectoration. In suppressed coughs of aged persons, and in asthma, it is doubtless useful; a gentle and constant stimulus on the throat should be kept up in these diseases. It has also been exhibited as a powerful remedy in cases of female obstructions. Dr. Chapman, of Philadelphia, has found it of great utility in obstinate amenorrhœa when given in decoction prepared by adding an ounce of the root to a pint of boiling water, which is slowly reduced by simmering to the quantity of one third. Four ounces of the decoction is to be taken during the day, increasing it when the menstrual effort is expected, as far as the stomach

will allow. If this excite nausea, he adds aromaticks. To prevent disgust, it is omitted a week or two in the intervals of the menstrual periods. It has been discovered in practice that the seneka root has proved one of the most valuable diaphoreticks in the low state of the system which attends the late epidemick termed spotted fever and typhoid pneumonia. The proper dose is from six to ten grains of the powder every three hours until the desired effect be accomplished. In chronick rheumatism this root has proved greatly beneficial by its universally stimulant and diaphoretick effects. The polygala sanguinea, a new species discovered at Savannah, has been used as a substitute for the polygala seneka.

Polygonum Bistorta. *Great Bistort. Snake Weed.* The root.

This plant is perennial, and grows wild in moist meadows in several parts of Great Britain. The root is about the thickness of the little finger, of a blackish brown colour on the outside, and reddish within: it is writhed or bent vermicularly (whence the name of the plant) with a joint at each bending, and full of bushy fibres; the root of the species here mentioned, has, for the most part, only one or two bendings; others, three or more. All the parts of bistort have a rough austere taste, particularly the root, which is one of the strongest of the vegetable astringents.

The root of bistort is employed in all kinds of immoderate hæmorrhagies, and other fluxes, both internally and externally, where astringency is the only indication. It is certainly a very powerful styptick, and is to be looked on simply as such. To the sudorifick, anti-pestilential, and other virtues attributed to it, it has no other claim but in consequence of its astringency, and of the antiseptick power which it has in common with other vegetable stypticks. The largest dose of the root in powder, is one drachm.

Polypodium Filix Mas. *Male Fern.* The root.

This fern is perennial, and grows in great abundance in almost every part of Britain, where the ground is not cultivated. The root when chewed, is somewhat

mucilaginous and sweet, and afterwards astringent and bitter.

The vermifuge powers of fern, are well known. It appears to be particularly active in expelling the tape worm. Dr. G. Jones relates the case of a lady in New York, who after taking many worm medicines, with partial good effects, drank a decoction of fern in water, (a pint per day) until some gallons were taken, when a dose of castor oil brought away the remnant of the worm, measuring forty-five feet.

The fern is the famous remedy of Madame Nuffer, of Switzerland, for the tape worm. She acquired the knowledge of the remedy from her husband, who was a surgeon, and obtained a great price for the secret from Louis 15th, of France, by whose order it was published.

The powdered plant was generally preferred by Mad. N. and may be given in doses of from sixty grains to two drachms.

PRINOS VERTICILLATUS. *Winter Berry. Black Alder.*
The bark and berries.

This is a very common shrub in many parts of the United States, and grows in the greatest perfection in swamps and marshy places. The bark is manifestly astringent. It is likewise considerably bitter, and pungent.

The berries, which are of a fine red colour, greatly partake of the bitter quality; and, if infused in wine or brandy, might be advantageously employed in cases where bitter tinctures are exhibited. The bark has been used as a substitute for the Peruvian bark, in intermittents and other diseases, both in substance and decoction. It is supposed to be chiefly useful in cases of great debility, unaccompanied with fever, as a corroborant in anasarcous and other dropsies, and as a tonick in cases of incipient sphacelus or gangrene. It is both given internally, and employed externally as a wash. On many occasions, it appears to be more useful than the Peruvian bark. Professor Barton says, it ought to have a place in the shops, and in the pharmacopœia of this country, when such a desideratum shall be supplied. Dr. Mease observes, (Philadelphia Medical Museum, vol. ii.) it is useful in mortification, united with the root of sassafras, in decoction, &c. The black alder is an excellent remedy in cutaneous affections. A decoction

or infusion will cure almost every species of herpes, if taken a tea cupful several times in a day for some time, and applied as a wash. Care must be taken to distinguish our prinos from the swamp alder or candle alder.

PRUNUS CERASUS. *Virginiana. Wild Cherry Tree.* The bark of both the tree and root.

The common wild cherry tree is often found in woods and hedges, and is associated with the trees of the forest, growing to the height of forty or more feet, and of a very large size. It is probably produced from the stones of the garden varieties dropped by birds. The timber is capable of receiving a fine polish, resembling mahogany, and is used by turners and cabinet makers, for many purposes. The gum which exudes from the tree is said to be equal to gum arabick. This tree produces in autumn a small bitter cherry, black when quite ripe, which serves for food for birds who frequently become intoxicated from eating them.* They are also infused in brandy by the country people on account of the pleasant aromatick flavour which they impart to the liquor. The bark of the wild cherry tree is powerfully tonick, and has been frequently substituted for the Peruvian bark, with great success. It is slightly narcotick, and commonly produces drowsiness in those who take it. From the experiments of Mr. C. Morris, of Virginia, (Inaug. Diss. 1812, Phila.) it appeared that the bark of the root was more powerful than the bark of the trunk. It has been very useful in dyspepsia and in consumption of the lungs. The Indians, it is said, use the bark in the cure of syphilis. Very excellent effects have been produced by washing ill conditioned ulcers with a decoction of the bark, and the same has proved anthelmintick. The leaves of this tree are poisonous to certain animals. While this valuable tree abounds in the United States, we act unwisely, says Dr. Mease, in sending thousands of dollars out of the country for the Peruvian bark.

Cherries that are sub-acid are, according to Dr. Willich, an excellent article of domestick medicine in the true scurvy, in putrid fevers, and the dysentery; as like-

* Dr. Darwin asserts, that water distilled from fifteen pounds of black cherry kernels when drawn off to a pint, possesses all the poisonous properties of laurel water.—*Botanick Garden (note.)*

wise to those persons, who are liable to obstructions in the alimentary canal. Nor will they be found less salutary to constitutions whose bile is vitiated, whose stomach is troubled with foul eructations, and who are afflicted with an offensive breath: all such persons should eat them freely, particularly on an empty stomach. For similar reasons, *dried cherries* form an excellent article of diet, in acute and inflammatory disorders: where they should be used both in substance and in decoctions, which are equally cooling and antiseptick.

PRUNUS DOMESTICA. *The French Prune Tree. Plum Tree.* The fruit, called French prunes.

Numerous varieties of prunes or plum tree, are cultivated by gardeners, the fruit of which, when dried, are called prunes. Great quantities of the dried fruit are imported from the continent of Europe, but the French prunes are thought the best.

They contain much mucilaginous and saccharine matter, and their medical effects are, to abate heat, and gently loosen the belly, which they perform by lubricating the passages, and softening the excrement. They are of considerable service in costiveness, accompanied with heat or irritation, which the more stimulating catharticks would tend to aggravate. Where prunes are not of themselves sufficient, their action may be promoted by joining with them a little rhubarb, or the like; to which may be added some carminative ingredient, to prevent their occasioning flatulency.

PRUNUS LAURO CERASUS. *Cherry Tree Laurel.* The leaves.

An exotick narcotick plant, not cultivated among us, but preserved in some hot houses and botanick gardens as a curiosity. The leaves have an odour slightly fragrant: their taste is extremely bitter. They possess a highly narcotick quality, which is extracted by infusion in alcohol or water, and is even brought over by distillation in the state of an essential oil, which the water partly dissolves. And the very singular fact has been established, that the volatile principle, in which the narcotick quality of this plant resides, is the prussick acid. It had

often been observed, that the odour of this acid is similar to that of the cherry-laurel, peach blossom, and bitter almond. Bohn found, that the distilled water of the bitter almond contained prussick acid. Schroeder discovered it in the distilled water of the peach blossom and cherry-laurel, prussiate of potass being obtained by distilling them from the alkali; and Bucholz succeeded in separating the prussick acid from the essential oil of the cherry-laurel, by agitation with an alkaline solution. This acid in its pure state has been further found to be highly narcotick; and the narcotick power of all these plants no doubt depends on it.

Cherry-laurel has ever been considered as a poison of the most deleterious energy, but it is now known it may be administered internally with perfect safety. In the few instances of its trial it has been found to give tone to the stomach, increase the appetite, and to exhilarate. Dr. Mayer, of Naples, gives the distilled water of laurel for the cure of virulent gonorrhœa; and by his advice an American captain affirms, that he cured thirty sailors by this medicine alone. It appears to retard the pulse and produce some sedative effects. It has been found serviceable in phthisis pulmonalis on a few trials. Professor Wurzer, of Bonn, gave fifty drops of the laurel water three times in a day, which was very efficacious in hypochondriack and nervous complaints. He finds the laurel water diminishes the too great irritability of the heart and muscular fibre, and augments, at the same time, the action of the absorbent vessels. It is recommended by some German authors in hydrophobia. Professor Osiander, of Gottingen, has employed very successfully the aqua lauro-cerasi, after the extirpation of a cancerous uterus, with the intention of mollifying the indurated and scirrhous remains; and in one instance he actually performed with this medicine a permanent cure of a complete scirrhous uteri with all the symptoms of a near approach to an open cancer. (New Eng. Med. Jour. vol. v. p. 314.)

Both the distilled water, and saturated tincture of the leaves of lauro cerasus, were administered in phthisis pulmonalis, by B. Lynde Oliver, M. D. of Salem, in the years 1810 and 1811. The result of his trials answered full expectation, and gave him confidence in the properties of the prussick acid, the efficient principle of which

is known to reside in this plant. (See prussick acid, in this volume.)

PTEROCARPUS SANTALINUS. *Red Saunders.* The wood.

This is a wood brought from the East Indies in large billets. The best kind is externally of a dull red, or nearly blackish colour, internally brown red; being of a compact texture, and possessing neither a peculiar smell nor taste. Red saunders is chiefly employed as a colouring drug, in the compound tincture of lavender; there is scarcely any other oil to which it communicates its tinge. It communicates a deep red to rectified spirit, but gives no tinge to aqueous liquors.

PYROLA UMBELLATA. *Winter Green.* The whole plant.

Among the recent acquisitions to our materia medica, is pyrola umbellata, appearing first in the medical botany, by professor Bigelow, and since introduced into our national pharmacopœia. This vegetable inhabits all latitudes in the United States, growing in shady woods, where it is protected from the sun, and flourishing with undiminished verdure, even when covered with the snow of winter. Six species of pyrola are natives of our soil, but the umbellata is the one used in medicine. Under the appellations *winter green* and *pipsissewa*, the newspapers have teemed with attestations of its virtues as a remedy in various diseases. These testimonies, although in general from persons out of the profession, have, by more correct observation, and by medical authority, been in a considerable degree corroborated. It is found in every forest, closely interningled with another well known evergreen, the boxberry, or chequerberry, and often surrounded by the uva ursi, to which it appears to be allied. The root is creeping, sending up stems at various distances. Stems ascending, hard and woody at base, somewhat angular, and marked with the scars of the former leaves. The leaves grow mostly in bunches or whorls, lanceolate, somewhat wedge-shaped, sharply serrate, decurrent on the petiole, smooth, firm, and coriaceous. The flowers appear in June and July, in an imperfect umbel, or rather corymb, of from three to six. variegated with purple and white, drooping.

The pyrola was employed with considerable success during the revolutionary war, in typhus, and was viewed as stomachick, tonick, and astringent. The bruised leaves, moistened with brandy, and applied to the skin, produced blisters. The late professor Barton found it to possess antilithick properties, and not essentially different from uva ursi. Professor Smith, of New Haven, assures me, that in one case of inveterate cancer he employed the pyrola both internally and externally with such favourable effects as convinced him that it possessed some specifick virtues as a remedy in that disease. I am informed by Dr. Miller, an experienced surgeon of Franklin, that he is in the practice of applying, by way of decoction and cataplasm, the leaves of this plant to chronick indurated tumours, which, in many instances, have been dispersed by its stimulant and vesicating effects. Professor Bigelow has made this article a subject of particular investigation and inquiry; and from his medical botany I quote the following as being worthy of full confidence. "The pyrola umbellata, though scarcely known as a medicine until within a few years past, has at the present day acquired a reputation of considerable extent in the treatment of various diseases. Its popular celebrity seems to have originated in its application to the treatment of fever and rheumatism; but the attention of physicians has been chiefly drawn towards its use in other complaints. The instances in which this plant has received favourable testimonies on medical authority, of its successful use, both in America and Europe, are principally the following: 1. As a palliative in strangury and nephritis. 2. As a diuretick in dropsy. 3. As an external stimulant, susceptible of useful application to various cases. In the first of these cases, the pyrola is entitled to attention and confidence. Some practitioners in this country have employed it with advantage in the same cases in which arbutus uva ursi is recommended.* Dr. Wolf, the German writer lately cited, has reported a number of cases of ischuria and dysuria, arising from various causes, in which the pyrola, given in infusion, produced the most evident relief, and took precedence of a variety of remedies which had been tried. His method of administering it was to give a table spoon-

* See Dr. Mitchell's inaugural dissertation, Philadelphia, 1803.

ful of a strong infusion, with a little syrup, every hour. In all the cases he has detailed, small as the dose was, it gave relief in a very short time. In one case its effect was so distinctly marked, that the disease returned whenever the medicine was omitted, and was removed on resuming its use. A tonick operation attended its other effects, so that the appetite was improved and digestion promoted during the period of its employment. The diuretick properties of the pyrola umbellata, seem to have been fully illustrated by Dr. W. Somerville, in a paper on this vegetable, published in the fifth volume of the London medico-chirurgical transactions. The facts presented by this physician afford satisfactory evidence of the power of this medicine to promote the renal excretion, and to afford relief to patients afflicted with dropsy in its various forms. The most distinguished case presented by him, is that of sir James Craig, the British governour in Canada, who was labouring under a general dropsy, which in its progress had assumed the forms of hydrothorax, anasarca, and ascites, and which was combined with different organick diseases, especially of the liver. After having tried with little or temporary success, almost every variety of diuretick and cathartick medicines, and submitted twice to the operation of tapping, the patient had recourse to a strong infusion of the pyrola, in the quantity of a pint every twenty-four hours. Although the case was altogether an unpromising one, yet the plant gave relief, not only in the first, but in the subsequent instances of its use. It increased the urinal discharge, and at the same time produced an augmentation of strength and an invigorated appetite. Several other cases of dropsy are detailed in Dr. Somerville's paper, in which the pyrola was administered by himself and by other practitioners with decided advantage. Dr. Satterly and Dr. Marcet are among those who have added their observations to the testimonies in its favour. Dr. Somerville found his patients to remark, that an agreeable sensation was perceived in the stomach soon after taking the pyrola, and that this was followed in some instances by an extraordinary increase of appetite. He considers it as having in this respect a great advantage over other diureticks, none of which are agreeable to the stomach, and most of them very offensive to it. He further states, that no circumstance had occurred within his own experience or information, to forbid its use in any form, or to limit the

dose. Dr. Wolf has given one very satisfactory case of the utility of our plant in ascites. He also found it to alleviate altogether the ardor urinæ attendant on gonorrhœa. Such are the important facts which to my knowledge have been published respecting the internal use of the pyrola umbellata. I have administered this plant on various occasions, and attended to its mode of operation. In a number of dropsical cases, when first given, it made a distinct and evident impression on the disease, communicating an increased activity to the absorbents, followed by a great augmentation of the excretion from the kidneys. The benefit, however, with me has been in most instances temporary, and it was found better to omit the medicine for a time, and to resume it afresh, than to continue it until the system had become insensible to its stimulus. After suspending it for a week or two, the same distinct operation took place on returning to its use, as had been manifested in the first instance. It proved in almost every instance, a very acceptable medicine to the patient, and was preferred both for its sensible qualities and its effects on the stomach, to other diureticks and alteratives which had been prescribed. The pyrola has been considerably employed as an external application in tumours and ulcers of various descriptions. It first acquired notice in consequence of some newspaper attestations of its efficacy in the cure of cancer. Those persons who know how seldom genuine cancers occur in comparison with reputed ones, will be more ready to allow it the character of curing ulcerous, than really cancerous, affections. There are undoubtedly many ulcers, and those frequently of a malignant kind, which are benefited by antiseptick stimulants; and to such the pyrola may be useful. But of its efficacy in real cancer we require more evidence than is at present possessed, before we ascribe to it the power of controlling so formidable a malady." The pyrola is one, and probably the principal article in a composition possessed by certain Indians as a remedy for scrofula. In their hands it has obtained very considerable reputation for having effected radical cures; their mode of administration is to macerate the leaves and roots for some time in cold water, and to give a teacup full three times in a day. Of the decoction or infusion, a pint or more may be given in a day. The extract has been administered

to the extent of five scruples in twenty-four hours, in the form of pills.

Quassia Excelsa. *Quassia.* The wood, bark, and root.

The quassia tree is a native of the West Indies, and of South America. Quassia derives its name from a negro named Quassi, who employed it with uncommon success as a secret remedy, in the malignant epidemick fevers which frequently prevail at Surinam. The root, wood, and bark of this tree, are all employed in medicine; but the latter, having a greater degree of bitterness, is more efficacious.

Quassia possesses no peculiar odour, but is one of the most intense, durable, pure bitters known. Its infusion, decoction, and tincture, are almost equally bitter, and yellowish, and are not blackened by chalybeates. It is an excellent tonick, antiseptick, and febrifuge: being one of the least heating drugs, it is found very serviceable in exciting appetite for food; expelling flatulency; assisting digestion; and particularly in removing costiveness, when produced by weakness of the intestines, such as is consequent to sedentary occupations.

Dr. Lettsom prescribed it with advantage, in cases of debility after febrile affections; in dyspepsia, arising from intoxication; and in diarrhœa; but he directed it with the greatest success, when combined with some absorbent in the hysterick atony of females. It has been exhibited in intermittent, and bilious fevers, lienteria, cachexy, dropsies, leucorrhœa, and gout.

It may be given, either in infusion, or in pills composed of the watery extract; the former preparation, however, is generally preferred, in proportion of three or four drachms of the wood, to twelve ounces of water; which is to be taken in doses of one, or two table spoonfuls, frequently repeated.

Quassia Simarouba. *Mountain Damson.* The bark.

This tree grows in Guiana, and in Jamaica. The bark of the root of this tree is brought to us, some feet long, and some inches in breadth, folded lengthwise. It is light, fibrous, very tough; of a pale yellow on the inside; darker coloured, rough, scaly, and warted on the outside; has

little smell, and a bitter, not disagreeable taste. It imparts its bitterness to alcohol and water.

It has been much celebrated in obstinate diarrhœa, dysentery, anorexia, indigestion, lienteria, and intermittent fevers, but it is doubtful whether it is better than other bitters. It is given in powder, in doses of half, or a whole drachm; but its best form is in decoction.

Quercus Robur. *Oak.* The bark.

The bark of this valuable tree is a strong astringent, and possesses tonick and antiseptick virtues. A chemical analysis of the white oak bark, as made by Mr. Davy, affords from one hundred and eighty grains of the inner bark in substance, seventy-two grains of pure tannin (that remarkable vegetable principle, the common and general source of the astringent and antiseptick properties.) In every astringent bark, says Mr. Davy, the interiour white bark contains the largest quantity of tannin.

White oak bark exceeds in astringency the Peruvian bark, and falls but little, if any short of it, in its tonick powers. Hence, we have a valuable domestick substitute for Peruvian bark, which is successfully employed in hæmorrhagies, alvine fluxes, and other preternatural or immoderate secretions. On account of the great difficulty in reducing it to a sufficiently fine powder, it is most commonly given in decoction.

Dr. Rousseau, in a communication published in the Philadelphia Medical Museum, vol. 2. has mentioned the efficacy of the black oak bark in intermittents, and it appears to be well worthy the attention of physicians. The powder, as prepared by Mr. Benger, is of the most extreme degree of fineness.

The bark of the Spanish oak, *quercus rubra montana, red oak of the mountain*, Dr. Barton has used in a case of gangrene of the foot, with such success, that he thinks it equalled in power the best Peruvian bark. He gave it in decoction in very large quantities, and the affected part was constantly kept wet with the same decoction, or with a poultice made of bread and milk with the bark.

The medicinal virtues of the bark of Spanish oak, are probably in no respect materially different from those of the bark of the common white oak of New England. Debilitated patients, whose stomachs cannot retain this medicine, may experience the happiest effects from bathing twice or thrice a day in a strong decoction of the oak

barks, about luke warm. It is particularly serviceable in the last stage of fevers.

Quercus Cerris. *Oriental Oak.* The nest of the cynips quercifolii, called gall nut.

This species of oak is a native of the Levant, and of the warm countries of Europe.

An insect, the cynips quercifolii, deposits its eggs in the leaves, and other tender parts of the tree. Around each puncture an excrescence is presently formed, within which the egg is hatched, and the insect passes through all its stages of metamorphosis, until it become perfect, when it eats its way out of its prison.

These excrescences are called *galls* or *gall nuts*. They are of different sizes, smooth or knotty on the surface, of a whitish, reddish, or blackish colour, and generally penetrated with a small hole. Galls have an austere styptick taste, without any smell; they are said to be the most powerful astringent we possess, and have therefore been often employed in medicine. It is asserted, that, by their internal use, in doses of half a drachm, or more, of the powder, intermittent fevers have been cured, even after Peruvian bark had failed.

An infusion, or decoction of galls, may be used with advantage as an astringent gargle; and an ointment of one part of finely powdered galls to eight of any simple ointment is applied with success in hæmorrhoidal affections.

Resina Pini. *Resin of Pine.* A resin, which is procured from pines of various species, deprived of its volatile oil.

The proper turpentines contain a large proportion of volatile oil, which is often separated from them by distillation. The residuum of the distillation gets different names, according to some peculiarities in its treatment. When the distillation is performed without addition, and continued until the whole essential oil be driven off, and there appear some traces of empyreuma, the residuum is fiddler's resin, or colophony: but if, while the mass is still fluid, a quantity of water be added, and thoroughly blended with the resin, by long and constant agitation, it is then called yellow resin.

This article is employed as an ingredient in ointments and plasters.

Rhamnus Catharticus. *Purging Buckthorn. Spina Cervina.* The juice of the berries.

This tree, or shrub, grows in woods or hedges; it attains if cultivated, the height of sixteen feet; it flowers in June, and ripens its fruit in September and October.

Buckthorn berries have a faint disagreeable smell, and a nauseous bitter taste. They have long been in considerable esteem as catharticks; and celebrated in dropsies, rheumatism, and even in gout: though in these cases they have no advantage above other purgatives, but are more offensive, and operate more severely than many with which the shops are furnished.

They generally occasion gripes, sickness, dryness of the mouth and throat; and leave a thirst of long duration. A syrup, prepared from the berries, is still kept in the shops, though seldom prescribed. The dose is one ounce of syrup, or about twenty of the fresh berries, and twice or thrice this number in decoction.

The bark of the buckthorn is said to be a mild tonick, astringent, and antiseptick medicine, and is recommended for the cure of intermittents; and in general debility, after chronick diseases. The decoction is of great service; reducing inveterate inflammations of the eye; and curing the itch, as it cleanses the skin, and abates the burning heat, without repelling the humours.

Rheum Palmatum. *Palmated Rhubarb.* The root.

Palmated, true, or officinal rhubarb, is a native of China, and the East Indies; whence its culture has been introduced into Europe. The rhubarb hitherto employed in medicine, is imported from Turkey, Russia, China, and the East Indies. The first sort is brought in roundish pieces, perforated in the centre; and which are externally of a yellow colour, but, on being cut, they appear variegated with reddish streaks.

The Chinese rhubarb is imported in long pieces, which are harder, and more compact than the Turkey rhubarb; the former possessing a weaker aromatick flavour, is less esteemed, though, being more astringent, it is, for some purposes at least, equal to the latter. The general characters of good rhubarb are, its having a whitish or clear yellow colour; being dry, solid, compact, and moderately heavy; brittle, easy to be pulverized, forming a powder

of a fine bright yellow, having a bitterish, somewhat astringent taste, and when chewed feeling gritty under the teeth, speedily colouring the saliva, and not appearing very mucilaginous.

The principal constituent of rhubarb is extractive matter, soluble both in alcohol and in water. By gentle decoction, it loses above one half its weight. The virtues of this root are destroyed by roasting, boiling, and in forming the extract.

Rhubarb is justly prized as a mild cathartick, and may be safely administered to children, invalids, and delicate women, in doses of from ten to twenty grains, though, in irritable, hysterical, and phthisical habits it is apt to occasion gripes, and aggravate febrile symptoms: hence it ought never to be given in the first stages of dysentery, when this invaluable remedy, by premature use, may occasion the most violent pain, and inflammation of the bowels; but, after the fever is suppressed, and the disease becomes a chronick diarrhœa, small doses of rhubarb are attended with the best effects.

Besides its purgative quality, it is celebrated as an astringent, by which it strengthens the tone of the stomach and intestines, and proves useful in diarrhœa, and disorders proceeding from laxity. Rhubarb exhibited in substance in the form of powder, operates more powerfully than in any other way. The dose for an adult is from a scruple to a drachm. On account of its great bulk it is sometimes unpleasant to the taste, and its laxative effects are often increased by the addition of neutral salts, or other more active purgatives. Combined with calomel, it is much more efficacious as a cathartick. The infusion is considerably weaker than the powder, and requires double the dose to produce the same effect. It is well adapted for children, but must be always fresh prepared. In the form of tincture, its principal use is as a tonick, and stomachick. Small doses of the powder are frequently exhibited with the same intention.

Attempts have been successfully made to introduce the culture of this valuable drug into Britain, and it appears from authentick accounts, that sufficient quantities of it may be reared, and that the English root has proved to be fully equal to the best sort obtained from Turkey or China.

The cultivation of rhubarb in the United States is to be considered as an object of high importance. That our

climate is perfectly congenial to its growth, has been clearly ascertained by successful experiments, which ought to encourage other attempts and more extensive plans. The palmated or officinal rhubarb may be raised from seed sown either in the spring or autumn. When the plants appear they require to be kept clear from weeds, and during the winter their roots should be covered with litter. The ensuing season they may be transplanted, or thinned, to the distance of four or five feet. The soil must be a light fine mould, deeply ploughed, and the plants should be frequently watered, though too much wet will injure the roots. The young plants require to be sheltered from the sun till they have obtained a good degree of strength. The seed stalks ought to be cut off on the withering of the radical leaves, and their roots covered. Rhubarb is now cultivated in New England to considerable extent, but the roots being taken up when too young and not properly prepared, it is only about half the strength of the foreign drug.

The roots of rhubarb must not be taken up until six or seven years old, and it is supposed by some that they increase in medicinal properties if suffered to remain in the earth for seven, eight, ten, or even twelve years. Much care is requisite in curing and preserving the roots for use. They lose about four fifths of their weight in drying, which process is accomplished in six months.

The roots may be taken up early in the spring, or in autumn, when the leaves are decayed. They are to be washed clean, and the small fibres and external rind being pared, or cut off, they should be divided into pieces about one ounce in weight. A hole should be perforated in the middle, and the roots suspended on pack thread, in a common kitchen, to dry; care being taken that none of the pieces come in contact with each other so as to occasion mouldiness. The foot stalks of the leaves of the young plants impart an agreeable acidity, similar to that of gooseberries, and are frequently used in pies and tarts.

RHODODENDRON CHRYSANTHUM. *Yellow flowered Rhododendron.* The leaves.

This small shrub grows in the coldest situations in Siberia. The leaves are oblong, rigid, reflected at the

edges, rough on the upper surface, smooth, and paler on the lower. When dried, they have no smell, but a rough, astringent, and bitterish taste. They also contain a stimulant narcotick principle; for they increase the heat of the body, excite thirst, and produce diaphoresis, or an increased discharge of the other secretions or excretions; and, in a larger dose, inebriation and delirium.

The Siberians use a decoction of it in rheumatism and gout. They put about two drachms of the dried shrub in an earthen pot, with about ten ounces of boiling water, keeping it near a boiling heat for a night, and this they take in the morning.

Besides its other effects, it is said to produce a sensation of prickling, or creeping in the pained parts; but in a few hours the pain and disagreeable symptoms are relieved, and two or three doses generally complete the cure. The use of liquids is not allowed during its operation, as they are apt to induce vomiting.

RHUS COPALLINUM. *Narrow leaved Sumach.* The berries.

Narrow leaved sumach grows naturally in most parts of the United States; rising to the height of six feet in a slaty gravelly soil. The berries are very acid, and are sprinkled with a grayish pounce, of an agreeable acid taste.

RHUS GLABRUM. *Pennsylvanian Sumach.* The berries.

Rhus glabrum, smooth Pennsylvanian sumach, common or upland sumach, rising to the height of eight or ten feet. The leaves are feathered, sawed, lanced, naked on both sides, and change to a beautiful red in autumn: it flowers in July. The seeds are arranged like the flowers, are red, and covered with a white powder of an agreeable acid taste.

The two species above described are considerably astringent. An infusion of the berries sweetened with honey is sometimes used for a gargle in sore throats, and for cleansing the mouth in putrid fevers. They are also recommended as useful in several of the arts. The leaves or berries are found a valuable substitute for *nut galls* in dyeing or making ink; they give a deep and permanent black. The plants in all their parts may be used as a

succedaneum for oak bark in tanning, especially the white glove leather.

Rhus Radicans. *Poison Vine. Poison Creeper.*

Poison vine, has a slender ascending stem, and frequently climbs up to the top of our tallest trees. The flowers, which appear in June, are produced along the whole course of the smaller branches; they are small, are of a light yellow colour, and have a delightful odour.

Rhus Typhinum. *Virginian Sumach. Stags Horn. Vinegar Plant.* The berries.

This plant grows naturally in almost every part of the United States. In Virginia and Pennsylvania, it rises to the height of twelve or fifteen feet, with a trunk of six or eight inches in diameter. The young branches are covered with a soft velvet-like down, and from their resemblance to the horn of a stag, the common people have given it the appellation of stag's horn. The flowers are produced in close tufts at the end of the branches, and are succeeded by seeds enclosed in purple, woolly, succulent covers; so that the branches are of a beautiful colour in autumn.

This plant resembles in its properties the rhus copallinum and glabrum.

Rhus Toxicodendron. *Poison Oak. Swamp Sumach.* The leaves.

Poison oak, a low shrubby stalk: leaves trifoliate, with pretty large foot stalks, lobate, entire, smooth, and somewhat heart shaped. The flowers come out from the sides of the stalks, in loose panicles, are small, and of a herbaceous colour. This plant, sometimes called poison wood, is so acrimonious, that the touching of the leaves, or rubbing them on the skin, occasions itching, inflammation, and eruption.

Dr. Alderson, of Hull, has given the leaves in four cases of paralysis, in doses of half a grain, or a grain, three times a day, with marked success; all his patients recovered to a certain degree, the use of their limbs. The first symptom of amendment was always an unpleasant feeling of prickling or twitching in the paralytick limbs. It

has been given in large doses, without experiencing the same success. It was not however inactive. In one case the patient discontinued its use on account of the disagreeable prickling it occasioned; and in general it operated as a gentle laxative, notwithstanding the torpid state of the bowels of such patients.

Rhus Vernix. *Varnish Tree. Poison Oak. Swamp Sumach. White Sumach.*

Swamp sumach is the largest of our native species of rhus; grows in swamps, and makes a fine appearance. In New England this is commonly called dogwood.

The rhus radicans, toxicodendrum and vernix, are highly poisonous, and are particularly active in warm weather, after a meal, and when the part touching the plant is moist with sweat. The rhus vernix is more violent than the other species, the poison will be communicated by touching, and by smelling any part of the shrub, or even by the smoke while burning, or the steams of a decoction of the plant. In about forty-eight hours an inflammatory eruption appears on the surface of the skin, attended by pain, swelling, itching, and fever. The eruptions sometimes suppurate, after which, the inflammation subsides, and the ulcers heal in a short time; but the patient frequently remains blind for several days. It operates, however, somewhat differently in different constitutions; and what is singular, some constitutions are incapable of being poisoned with it at all. The remedies are bloodletting; when the symptoms are violent, smart purging, especially by sea water; cold water, or ice, or a wash of spirits of *sal ammoniac* diluted with water, or of lead water applied to the parts. Dr. Barton has always found a solution of *corrosive sublimate* in water, to answer the purpose of effecting a speedy cure.

One case of the remarkable effects of this poison has fallen under the observation of the compiler of this volume. The patient, having incautiously expressed a quantity of the juice from the leaves of a species of rhus, was soon after attacked with violent inflammation, eruption, and swelling of the whole body, with fever and extreme pain. The whole surface of the body, swelling of the head, and blindness, exhibited the appearance of the most malignant kind of small pox; and so obstinate were the

dangerous symptoms, that with the loss of his hair and nails, it was several weeks before a cure was effected.

Dr. T. Horsefield, in his excellent inaugural dissertation on the rhus vernix, rhus radicans, and rhus glabrum, declares his full conviction, after many judicious experiments, that the rhus vernix is the true varnish tree of Japan, described by Kempfer. He found that the greatest quantity of juice was obtained from incisions made in the tree about the middle of May. Thunbery, and others, are also of opinion, that the Japanese varnish so much celebrated, may be obtained from our native rhus. It is a subject undoubtedly worthy of attention.

A singular instance is related in the Medical Repository of the poisonous effects of the *rhus vernix* on a swarm of bees, the whole of which the day after they attached themselves to the branch, were found dead, and their bodies turned black, and swelled to nearly twice their natural size.

Ribes. *Currant tree.* The fruit.

The fruit of the *red*, and *white currants* of our gardens are greatly esteemed for their pleasant and nutritive qualities.

In fevers, the juice of currants, when mixed with an equal quantity of sugar, and made into a jelly, is cooling and grateful to the stomach; being in a slight degree astringent and antiseptick. *Currant wine*, with the addition of water, is an excellent beverage during the heat of summer. Various receipts are given for making this liquor in the Dom. Encyclopedia.

Black currant is found growing, naturally, near *Kennebeck river*, and they are also cultivated in gardens.

This fruit is reputed to be very wholesome, and their juice is frequently boiled down into an extract or syrup with sugar, in which state it is called rob, and much esteemed in sore throats of the inflammatory kind.—The fruit is often put into rum or brandy instead of black cherries. An infusion of the young roots is useful in fevers of the eruptive kind; and in the dysenterick fevers of cattle.

Wine made from black currants has been found exceedingly efficacious in pneumonia and other pulmonick fevers, when of a malignant nature, and should be administered in a liberal manner.

Ricinus Communis. *Palma Christi.* The seeds and their fixed oil, called castor oil.

The palma christi is a native of the West Indies, and flourishes extremely well in almost every part of the United States. In Georgia and South Carolina, its growth is very luxuriant, rising to the height of fifteen or twenty feet, even without the assistance of the hand of culture, and exhibiting a beautiful appearance. In Mr. Drayton's history of South Carolina, it is asserted that its produce is from one hundred to one hundred and fifty gallons of oil per acre. Estimating this at two dollars per gallon, the ordinary price, it will be found to afford ample encouragement for its extensive cultivation, especially since the plant is not liable to be greatly affected by the vicissitudes of the season. It answers best in a rich sandy soil, and the seed should be put in early in the spring. The seeds are about the size of small beans, which, in their brittle shells, contain white kernels, of a sweet, oily, but somewhat nauseous taste. The skin is extremely acrid, and one or two of the seeds swallowed entire, operate as a drastick purgative or emetick.

The kernels yield almost a fourth part of their weight of a bland fixed oil, commonly called castor oil.

It is obtained from them either by expression or decoction with water. The former method is practised in Europe; the latter in Jamaica. To increase the product, it is common to parch the seeds over the fire, before the oil is extracted from them; but the oil thus obtained, is greatly inferiour to that prepared by cold expression, or simple decoction, and is apt to become rancid. The most eligible method is, to shell the seeds and boil them in water; as the oil rises, skim it off. This oil is sweet, without bad taste, or smell, and as clear as olive oil; and may be kept much longer than that obtained by expression, because the water detains the mucilage, which abounds in the expressed oil, and disposes it the sooner to become rancid, and unfit for internal use. Genuine castor oil is thick and viscid, of a whitish colour, insipid or sweetish to the taste, and without smell.

Castor oil is a gentle and useful purgative; it in general produces its effects without griping, and may be given with safety, where acrid purgatives are improper, as in colick, calculus, gonorrhœa, &c. It is also one of the best

vermifuges, and a most efficacious remedy for the dry bellyache and iliack passion, when administered in proper doses, to children and adults; viz. the dose for the former, from one to two teaspoonfuls; and the latter, a table spoonful, repeated every two or three hours. Half a teaspoonful has been given with success to new-born infants, for lubricating the intestines, and expelling the *meconium*. As patients in general have a great aversion to this oil in its pure state, it may be taken swimming either in a glass of peppermint, or simple water, or in the form of an emulsion, with mucilage, or with the addition of a small quantity of rum.

Castor oil is an excellent cathartick in dysentery; sheathing the intestines from acrimony and irritation, and well adapted to relieve tormina and tenesmus. In obstinate constipation, in hæmorrhoides, and in the diseases of lying-in women, it is extremely valuable. It may be most conveniently exhibited in the form of oleaginous mixture. Castor oil, one ounce. Powdered gum arabick, two drachms. Loaf sugar, one drachm. Laudanum, forty drops. Cinnamon or mint water, two ounces, m. Dose, a table spoonful, every hour or two.

Rosa Gallica. *Red Rose.* The petals.

The gallica, French or common red rose, has large, spreading, half double, deep red flowers. It has not the fragrance of the damask rose; but the beautiful colour of its petals, and their pleasant astringency, have rendered them officinal. It must however be remarked, that their odour is increased by drying, while that of the damask and moss roses is almost destroyed.

Rosa Damascena. *Damask Rose.* The petals.

This is justly termed the *queen of flowers*, and both its elegance and fragrance have rendered it the favourite ornament of every garden. It is sometimes called Dutch hundred leaved rose. The damask rose yields on distillation, a small portion of butyrous oil, together with a water, which possesses the odour and taste of the roses, and are generally esteemed for the agreeable flavour they impart to culinary preparations, and also to cordials. A valuable perfume is obtained from the flowers by dis-

tillation, called *ottar* or *essence of roses*. The true ottar of roses is sold in the East Indies, at the exorbitant price of *twenty guineas* and upwards per ounce. It is doubtless the most elegant perfume in vegetable nature; as a single drop imparts its fragrance throughout the room or dwelling, and suppresses other less agreeable odours.

Rosa Canina. *Dog Rose*. The fruit, called hips.

The common wild briar, or hip tree, an indigenous plant, growing in woods and hedges. In the month of June it bears oval flowers, which are succeeded by red egg shaped berries. It is the fruit of this shrub, that is employed in Britain by the apothecary for making the conserve of hips. The pulp of the fruit, besides saccharine matter, contains citrick acid, which gives it an acid taste.

Rosmarinus Officinalis. *Rosemary*. The flowering tops.

Rosemary is a shrubby perennial, which grows wild in the south of Europe, and is cultivated in gardens. It has a fragrant smell, and a warm pungent bitterish taste, approaching to those of lavender: the leaves and tender tops are strongest; next to these the cup of the flower; the flowers themselves are considerably the weakest, but most pleasant. From the leaves, tops, and flowers of this plant an essential oil is prepared; or, when distilled with spirit of wine, they afford the celebrated *Hungary water*.

These liquid medicines are esteemed excellent cephalicks, in nervous and hysterical affections, and have been found eminently serviceable in apoplexies, palsies, and vertigoes, in which cases they are sparingly applied to the temples and forehead.

Rubia Tinctorum. *Madder*. The root.

Madder is perennial, and grows wild in some parts of Britain, but the dyers are principally supplied with it from Zealand, where it is cultivated in large quantities.

The roots consist of articulated fibres, about the thickness of a quill, which are red throughout; have a weak smell, and a bitterish astringent taste. For the use of

dyers, they are first peeled and dried, then bruised and packed in barrels.

The root of the common or wild madder is an excellent detergent, and aperient; on which account it has been highly recommended in visceral obstructions, particularly of the uterus; in coagulations of the blood, induced either by falls or bruises; in the beginning of dropsical complaints, and especially in the rickets. It may be given pulverized in doses of from five to fifteen grains to children; and from half to a whole drachm, three or four times in a day, to adults. When taken internally, it possesses the remarkable quality of tinging the urine of a deep red colour, and produces similar effects on the bones of animals, if eaten with other food. Madder might be profitably cultivated in the United States.

RUBUS VILLOSUS. *High Blackberry.*

RUBUS PROCUMBENS. *Low or Running Blackberry, or Dewberry.* The roots.

These require no description; but their valuable properties merit the attention of every medical practitioner. In domestick practice the roots of blackberry have acquired great confidence where they have been used for their astringent virtues in the various forms of bowel affections. It is deserving of the highest praise, as one of the most active and effectual vegetable astringents which our country produces. The low blackberry or dewberry is the one commonly preferred, and the root is more astringent than the leaves or fruit. It is exhibited in decoction, in the quantity of a teacup full for an adult, or a table spoonful for children, several times in a day. One ounce of the root gives to a pint of water the proper strength. The diseases in which it displays its efficacy, are dysentery in its closing stage, chronick diarrhœa, and cholera infantum, to check inordinate evacuations, after purgatives have been duly employed. Professor Chapman of Philadelphia, in his practical lectures, has extolled the root of this vegetable as an astringent of superiour powers, and thinks it well adapted to a depraved state of the stomach and digestive organs. Dr. Mease, in his edition of the Domestick Encylopædia, says, "A jelly made of blackberries, when on the turn from red to black,

is much used in the United States for the gravel. A friend of the editor, subject to this disease, spoke highly in praise of the remedy." It is not improbable that a decoction of the root would be still more efficacious in the same complaint, and that it may be extended to other diseases also. We may perhaps anticipate the time, when this vegetable will be received as an acquisition to our materia medica; and as it is a cheap and pleasant medicine, easy to be procured in every situation, it should be recommended to general attention.

RUMEX BRITANNICA. *Yellow rooted Water Dock.* The root and leaves.

It grows in peat marshes, wet ditches, pools, at the sides of rivers, and in shallow water. It flowers in July and August, and is succeeded by large seeds. This plant affords a medicine of considerable efficacy, when applied externally, as a wash for spongy, putrid gums; its roots when pulverized have been found excellent for cleaning the teeth. These roots are of a bitter, astringent taste, and have often been employed for the cure of scorbutick and cutaneous disorders, whether administered internally, or applied externally in ointments, cataplasms, lotions, or fomentations. Decoctions of the leaves are, likewise, an efficacious laxative, and have been taken with advantage in rheumatick pains, and chronical diseases, occasioned by costiveness, or by visceral obstructions. The dose usually given, is a decoction of half an ounce of the fresh roots, or from one to two drachms of them, in a dry state.

The Indians, says Dr. Cutler, used the root of water dock with great success in cleansing foul ulcers. It is said, they endeavoured to keep it a secret from the Europeans.

Dr. Withering says, he saw an ill conditioned ulcer in the mouth, which had destroyed the palate, cured by washing the mouth with a decoction of this root, and drinking a small quantity of the same decoction daily.

RUMEX CRISPUS. *Curled Dock.* The root.

This is common about barn yards and in pasture grounds; flowering in June. Root fusiform, perennial. Stem furrowed, smooth. Calix valves ovate, entire, graniferous. Leaves lanceolate, acute, waved and curled on the margin. Racemes of half whorls, leafy towards the base.

The roots of this plant possess some purgative properties. The seeds are said to have been given with advantage in dysentery. The fresh roots, bruised and made into an ointment or decoction, are frequently employed by the country people to cure the itch. Some instances have occurred among the country people, of ill conditioned ulcers, and hard tumours having been entirely removed by the application of the bruised roots, or a decoction of the same.

Ruta Graveolens. *Rue.* The herb.

This is a small shrubby plant met with in gardens, where it flowers in June, and holds its green leaves through the winter. It has a strong ungrateful smell, and a bitterish, penetrating taste; the leaves when in full vigour, are extremely acrid, insomuch as to inflame and blister the skin if much handled. Former writers on materia medica have entertained a very high opinion of the medicinal virtues of this plant, and it is still retained in the Massachusetts and other pharmacopœias. It has been considered as powerfully stimulating, attenuating, and detergent, and hence, in cold phlegmatick habits it quickens the circulations, dissolves tenacious juices, opens obstructions of the excretory glands, and promotes the fluid secretions. Boerhaave is extravagant in his praises of the essential oil and distilled water of rue, for their efficacy in promoting sweat and perspiration, and for the cure of the hysterick passion and of epilepsies, and for expelling poison. In modern practice, rue is not regarded as possessing much power as a remedy.

Saccharum Officinarum. *Sugar Cane.* Sugar.

a. brown, or impure.

b. double refined, or most pure.

The sugar cane grows wild in both the Indies, and forms the principal object of cultivation in the West Indies.

It grows to the height of from three and a half to seven, and sometimes to twelve feet, in strong, deep lands. When ripe it assumes a fine straw colour, and is usually cut at the age of twelve or fifteen months, according to the season, or the nature of the soil.

Sugar is principally obtained from the plant by boiling

down its expressed juice, with the addition of a certain proportion of lime or potass, until the greater part be disposed to concrete into brownish or yellowish crystalline grains. In this dry state, it is called *raw* or *muscovado* sugar, and is sent to Europe, where it is subsequently refined. This is performed by dissolving it in water, boiling the solution with lime water, clarifying it with blood or white of eggs, and straining it through woollen bags. The solution, when in a proper state, is poured into conical forms of unglazed earthen ware, where it concretes into a mass of irregular crystals. The syrup, which has not been crystallized, is then permitted to run off through a hole in the apex of the cone. The upper or broad end of the cone is then covered with moist clay, the water of which gradually penetrates into the sugar, and displaces a quantity of syrup, which would otherwise be retained in it, and discolour it. It is then carefully dried, and gets the name of *loaf* or *lump sugar*. When the solution, and other steps of the process are repeated, the sugar is then said to be *double refined*. Sugar is sometimes made to assume a more regular form of crystallization, by carrying the evaporation only to a certain length, and then permitting the syrup to cool slowly: in this form it is called *brown* or *white sugar candy*, according to the degree of its purity.

Sugar is a very wholesome and powerful article of nourishment; for during crop time, the negroes in the West Indies, notwithstanding their increased labours, always grow fat. It produces no particular effect as a medicine, except that the coarser and impure kinds are slightly purgative. In pharmacy, it is principally employed to cover bad tastes, to give form, and to preserve more active substances. In using it for the last purpose, we must always remember, that if the proportion of sugar employed be too small, it will promote instead of retarding the fermentation of the articles it is intended to preserve. Molasses or treacle is a very impure syrup, which remains after refining the sugar. Treacle is applied to many domestick economical purposes; and, in hospital practice, may supersede the use of sugar in many instances. Sugar candy is used by persons labouring under hoarseness and coughs; the violence of which it contributes to relieve, by lubricating the membranes, and promoting expectoration.

Salix Alba. *White Willow.* The bark, and the bark of the root.

The species or varieties of the willow, which have been noticed by botanical writers, are very numerous ; and it is probable that the bark of all of them possesses properties in many respects similar. In 1763, Mr. Stone, an English clergyman, presented a paper to the Royal Society, on the beneficial effects of the *salix alba*, or white willow, in intermittent fevers ; and Dr. Cullen, on this authority, and from the sensible qualities it possesses, recommends it, in his *Materia Medica*, as a substitute for the cinchona. Mr. Stone gathered the bark in summer, when it was full of sap ; dried it by a gentle heat, and gave a drachm of it powdered every four hours, betwixt the fits. In a few obstinate cases he mixed it with one fifth part of the cinchona. Some judicious physicians here, says Dr. Cutler, made trial of the bark of white willow, and recommend it as a valuable substitute for the Peruvian bark. They have used principally the bark of the root.

Salix Latifolia. *Broad leaved Willow.* The bark.

This possesses greater medicinal properties than any of the other species of salix ; and is now substituted by many British physicians for the Peruvian bark. Three British pamphlets upon this subject have been published within a few years ; the last, by Dr. Wilkinson, (1803) is replete with encomiums on the remedy in question. This species of salix may be distinguished by the shape of its leaves from all others, except the salix pentandra, or bay leaved willow. But the leaves of the latter are smooth and shining, and of a deeper green ; nor have they the downy appearance on the under surface, which is so remarkable in the *salix caprea*, or *latifolia*. It is found in woods and hedges, on hilly situations, and delights in cold, clayey, moist ground. The most proper time to gather the bark, is in May or June. It should be cut in small pieces, and dried in the shade. This bark is very astringent to the taste, and somewhat bitter, but it loses the latter quality when dry. Dr. Wilkinson directs one ounce and a half of the coarse powder of the bark to be infused in one quart of water for six hours ; then to boil it over a gentle

fire for a quarter of an hour, and strain for use: of this the ordinary dose is two or three large spoonfuls, three or four times a day; but in the ague and fever, one or two ounces may be given every third hour, in the interval of the fit. The strong decoction of this bark resembles port wine in colour, for which, by several who have seen it in vials, it has been mistaken.

Dr. Wilkinson relates sixteen cases of disease, in which this bark was employed with decided advantage, and from which he does not hesitate to assign to it virtues greatly superiour to those of the cinchona: in particular, he relates a case of extreme emaciation from an ulcerated foot, which was perfectly cured, after having resisted the continued use of Peruvian bark, and the exertion of the physicians of two publick charities. It is doubtless a remedy of considerable efficacy, and is strongly recommended on account of its cheapness, and the facility of procuring it. It appears to be useful in most cases where the cinchona is usually resorted to.

The attention of medical men should be directed to the inquiry, whether the *salix latifolia* may be found in the United States, as it promises to afford a valuable substitute for the *cinchona;* the price of which has become exorbitant, and its quality greatly impaired by base and fraudulent adulterations.

Salvia Officinalis. *Sage.* The leaves.

The leaves of the sage have a peculiar aromatick smell, and a warm aromatick taste, with some degree of bitterness and astringency.

In its effects, sage agrees with other aromaticks. It is stimulant, carminative, and tonick. In cold, phlegmatick habits, it excites appetite, and proves serviceable in debilities of the nervous system. The best preparation for these purposes, is an infusion of the dry leaves, drank as tea; or a tincture, or extract, made with rectified spirit, taken in proper doses; these contain the whole virtues of the sage; the distilled water and essential oil, only its warmth and aromatick quality, without any of its roughness or bitterness.

Aqueous infusions of the leaves, with the addition of a little lemon juice, prove a useful diluting drink in febrile disorders, being sufficiently agreeable to the palate.

Sambucus Nigra. *Common Elder.* The inner bark, flowers, and berries.

This tree is frequent in hedges; it flowers in May, and ripens its fruit in September. The berries contain malick acid, and have a sweetish, not unpleasant taste; nevertheless, eaten in substance, they offend the stomach.

The expressed juice, inspissated to the consistence of a rob, proves a useful aperient medicine; it opens obstructions of the viscera, promotes the natural evacuations, and, if continued a length of time, does considerable service in various chronical disorders. A syrup made from the expressed juice of the berries, to which one third of the quantity of brandy is added, has been found useful in the bowel complaints of children.

The inner green bark of its trunk is greatly cathartick. An infusion of it in wine, or the expressed juice, in the dose of half an ounce or more, is said to purge moderately; and, in smaller doses, to prove an efficacious deobstruent, capable of promoting all the fluid secretions.

The young leaf buds are strongly purgative, and act with so much violence, as to be deservedly accounted unsafe. The flowers are very different in quality; these have an agreeable aromatick flavour, which they yield in distillation with water, and impart by infusion to vinous and spirituous liquors.

Sanguinaria Canadensis. *Blood Root.* The root.

This indigenous plant is common in the United States, and is called also puccoon, red root, Indian paint, turmerick, &c. It grows in rich woodland, and flowers in April. The leaves are roundish, one only to a stalk, and deeply indented; stems naked, supporting single flowers; blossoms white. The stalk is six or eight inches long, and of the thickness of a quill. Externally the root is of a brownish red colour. When the fresh root is broken, a bright or orange coloured juice issues from it. The Indians used it for painting themselves, and highly esteemed it for its medicinal virtues. The powdered root, in doses of fifteen or twenty grains, is powerfully emetick, but it must be given with caution. Eight grains is a mild dose. According to Dr. Downy's inaugural dissertation, the

leaves and seeds of the plant are a powerful and diffusible stimuli, promote sweat, and are given in Maryland with that view to horses to promote the shedding of their coat. The seeds are said, by the late Dr. Barton, to possess nearly the same quality of those of stramonium, inducing fever, delirium, dilated pupil, &c. A deleterious property resides also in the leaves. The root is the only part used in medicine, and is found to be a good expectorant, and apparently allied in properties to rattle snake root. It has recently been found to be a valuable substitute for digitalis in the cure of coughs and pneumonick complaints. According to the experience of professor Smith it possesses the same power of diminishing the frequency of the pulse as the digitalis when exhibited with the same views, and is equally efficacious in pulmonick affections, and is much less apt to induce debility and dangerous consequences. In acute rheumatism he gives it in the form of infusion, and in such doses as to produce a sense of weakness, and repeats the dose two or three times in twenty-four hours, until it diminishes the febrile heat and frequency of the pulse. Dr. Smith has recently had many opportunities of witnessing the beneficial effects of blood root in diseases of the lungs and croup, in which last he deems it a sovereign remedy. The case of a woman labouring under croup was so violent that the professor found the attending physician prepared for the operation of opening the trachea. He gave a strong infusion of blood root in table spoonful doses repeated once in twenty minutes, and in two hours the disease was cured so far that she breathed with perfect ease. He has witnessed the effects in several cases where it was equally and as speedily beneficial.*

Professor Bigelow has ascertained by chemical analysis, that the root of sanguinaria consists of a resinous, a bitter, an acrid and colouring principle, together with fecula and fibrous or woody portion; and that its medicinal properties are those of an acrid narcotick. In a dose of from eight to twenty grains of the fresh powdered root it occasions heart burn, nausea, faintness, and frequently vertigo and diminished vision. At length vomiting ensues, but in this operation it is less certain than other emeticks in common use. When given in smaller doses such as produce nausea without vomiting, and repeated at frequent intervals, it lessens the frequency of the pulse

* His letters to the author.

in a manner somewhat analogous to the operation of digitalis. Dr. Bigelow cites professor Smith, and professor Ives, of New Haven, relative to the medical virtues of sanguinaria; the former gentleman, in a paper on this plant, published in the London medical transactions, states, that he found the powdered root to operate violently as an emetick, producing great prostration of strength during its operation, which continued for some time. Snuffed up the nostrils it proved sternutatory, leaving a sensation of heat. Applied to fungus flesh it proved escharotick, and several polypi of the soft kind were cured by it in his hands. He found it of great use in the incipient stages of pulmonary consumption; and acute rheumatism and jaundice was relieved by its use. Professor Ives has administered the blood root with great success in typhoid pneumonia, in plethorick constitutions when respiration is very difficult, the cheeks and hands become livid, the pulse full, soft, vibrating, and easily compressed,—the blood root has done more to obviate the symptoms and remove the disease, than any remedy which he has used. In such cases he observes, the dose must be large in proportion to the violence of the disease, and often repeated until it excites vomiting, or relieves the symptoms. He infuses from a scruple to half a drachm of the powdered root in half a gill of hot water, and gives one or two tea spoonfuls every half hour in urgent cases until the effect is produced. This treatment has often removed the symptoms in a few hours. Dr. Ives thinks highly of its use in influenza and phthisis, and particularly in hooping cough. He also states that given in large doses sufficient to produce full vomiting, it often removes the croup, if administered in the first stages. It has been given, he remarks, for many years in the country, some physicians relying wholly on this remedy for the cure of croup. Dr. Bigelow states, that Dr. Macbride, of Charleston, South Carolina, has found the blood root useful in hydrothorax, given in doses of sixty drops of the tincture *ter de die*, and increased until nausea followed each dose. In torpor of the liver, attended with colick, and yellowness of the skin, and also in jaundice, he has used the puccoon with evident advantage. He prefers the pill or powder, (dose from two to five grains) and vinous infusion to the spirituous tincture. In the New England journal, volume eighth, is published a very excellent communication from Dr. William Tully, of

Connecticut, containing a summary of the experience of himself and friends, who have administered the blood root extensively. He observes, "In moderate doses it increases the excitement of the sanguiferous system, augments the action of the lymphaticks of the viscera, excites appetite and promotes digestion. In larger doses, it nauseates, diminishes sanguiferous action, and still further increased, it vomits. In improper quantities, it vomits with much violence, produces heart burn, faintness, dizziness, diminished vision, and great prostration of strength. It may be considered as tonick, deobstruent, emetick, narcotick, sternutatory, antipsoraic, and escharotick. By suitable management, and qualification, it may be able to produce the most useful effects of squill and senega, without their tendency to vomit and purge; of foxglove, without danger of prostrating the powers of life; of ammoniacum, and guaiacum, without their occasional irritation; and of the mineral tonicks, without their slowness. As an emetick, the powder or pill may be administered in doses of ten or twenty grains, or better, an infusion or decoction, made in the proportions of one drachm of the root, to four ounces of water, which may be given in doses of two or four drachms to be repeated at short intervals, till it vomits. For this purpose, it may frequently be used with advantage, to remove that state of predisposition to disease, which is marked by languor, lassitude, anorexia, &c. Also in the early stages of pneumonicula, pneumonia typhoides, catarrh, and phthisis pulmonalis; and likewise in pertussis, and icterus. If given early in cynanche trachealis, it may be considered as almost a specifick. As a deobstruent, tonick, and narcotick, the powder or pill may be given, at regular and short intervals, in doses of three or five grains, or the tincture or wine, made in the proportion of two ounces of the root to one pound of spirit or wine, commencing with about fifteen drops, at periods of three, four, or six hours, and gradually increasing the quantity, as the stomach will bear, to sixty or eighty. When administered with these intentions, it should almost always be combined with opium, which not only increases its general efficacy, but lessens its nauseating tendency. For all the variety of cases to which it is adapted, with these views, but two forms are necessary; and these seem preferable to every other. The first, which is more especially intended for children, may consist of equal parts of camphorated tinc-

ture of opium, and tincture, or wine of sanguinaria; the second, which will commonly be more proper for adults, is formed of one part simple tincture of opium, and three parts tincture, or wine of sanguinaria. It is remarkable, that blood root, although not known to purge, or, strictly speaking, to prove laxative when taken by itself, is nevertheless capable of completely obviating any constipating effect from opium combined with it, even when in considerably larger proportion than is here recommended, and that too in habits naturally costive; and although it seems never to be diaphoretick, yet it is usually an efficacious expectorant. The diseases in which it may be advantageously used, in the last mentioned forms, and in the last mentioned intentions, are,

1st. Pneumonicula, or that sub-acute inflammation of the lungs, which in consumptive habits, so often precedes a rapid phthisis. After a slow cathartick of calomel, suitable epispasticks, and perhaps calomel and opium in small doses, sufficient to produce a very slight effect upon the mouth, the remainder of the cure may in general be trusted to sanguinaria and opium. 2d. In pneumonia typhoides, after proper evacuations, and blistering, it proves an important adjuvant to the course customarily necessary. Indeed, in quite moderate cases, the preparations in question are alone amply sufficient for the secondary stages. 3d. In catarrh, after evacuations, nothing more than sanguinaria, in the first form of combination, is commonly necessary. 4th. In confirmed phthisis pulmonalis, this article, for the purpose of combating and palliating symptoms, and thus prolonging the life of the patient, is perhaps of more value than any thing else. 5th. In pertussis, if vigorously administered, and faithfully persevered in, it is one of the best remedies. 6th. In icterus, it excites healthy action in the liver, and gives tone. 7th. In hydrothorax, not depending upon organick affection, simple blood root, given three or four times a day, in a nauseating dose, and continued for several weeks, often lessens the frequency of the pulse, occasions absorption of the fluid, and leaves the system in such a state of tone, as to prevent a return of the complaint. 8th. In rheumatismus, in a variety of cases, it has been found, with sufficient opium, to supply the place of guaiacum. 9th. In asthenic amenorrhœa, or clorosis, it sometimes restores tone, and proves emmenagogue. 10th. In gonorrhœa, and the bites of venomous reptiles, it may be considered as efficacious for internal use, as any reme-

dies hitherto proposed. 11th. In many of those cases of debility, and loss of appetite, in which quassia, colomba, or gentian are used in combination with super-sulphate of zinc, blood root alone is a good substitute for the metallick tonick.

It is a circumstance, which greatly lessens the value of blood root, that its powers are very much impaired by age. The recently dried root possesses the greatest activity, but in the course of a few months, its virtues are diminished, as much as one half, and perhaps more. The same is true of the tincture, and the wine, but the latter retains its efficacy the longest. The dose, therefore, must be in some measure regulated by the age of the preparation."

The above consideration alone is sufficient to induce physicians to cultivate this plant in their gardens, and to prepare the medicine for their own use. If it be planted in rich shady borders, it flourishes well, and the large leaves and blossoms make an agreeable appearance soon after the frost is out of the ground.

Sapo. *Soap.* Prepared with oil of olives and soda, called castile soap.

Soap is a composition of fixed alkaline salt, in a state of combination with animal or vegetable oil; it is sometimes dry, and hard; at others, soft and liquid; being manufactured various ways, with and without heat.

The only difference in the various kinds of manufactured soap, is, in the oils employed in the composition. Thus, the common hard soap is prepared from the caustick ley, with the addition of tallow. The *Venice*, *Alicant* or *Spanish* soap, with olive oil; green soap, with that of rape, hemp, or linseed; black soap, with train oil; and, lastly, the ordinary soft soap, is formed by using potass as a substitute for soda, together with tallow, or train oil, to which is added a large quantity of common salt.

The perfumed compounds, known under the names of palm, violet, almond, or other soaps, are prepared in a similar manner; the oils of such vegetable substances being employed instead of those of the usual kind.

The alkaline soaps have an unpleasant taste, and a peculiar smell; form a milky solution with water, and

a transparent one with alcohol, and are powerfully detergent.

The only species which is officinal in our pharmacopœia, is that composed of olive oil and soda. It is only prepared in the countries which produce the oil. For medicinal use, we prefer the Spanish.

It should be white and hard, dissolved entirely in water and in alcohol, forming with the former a milky, and with the latter a transparent solution; the solution should froth freely on agitation. It should not be variegated in its colour, feel greasy or moist, or be covered with a saline efflorescence; and the solutions should not have a rancid smell or taste. Some of the foreign dispensatories are so very particular about the nature of the soap, used in medicine, as to direct it to be prepared by the apothecary, by simply triturating (without the assistance of heat) Provence oil, with half its weight of a solution of soda, of the specifick gravity of 1.375, until they unite.

Soap is decomposed by all the acids, earths, and earthy and metalline salts. The acids combine with the alkali and separate the oil. The earths form an insoluble earthy soap with the oil, and separate the alkali; while with the salts there is a mutual decomposition, their acid combines with the alkali, and earthy, or metalline soaps are formed.

The detergent property of soap, or the power it possesses of rendering oily and resinous substances miscible with water, has given rise to very erroneous notions of its medical virtues. It was supposed to render such substances more readily soluble in the juices of the stomach, and in the fluids of the body, and to be well fitted for dissolving such oily and unctuous matters as it may meet with in the body, attenuating viscid juices, opening obstructions of the viscera, and deterging all the vessels it passes through.

It has likewise been supposed a powerful menstruum for the urinary calculus; and a solution of soap in lime water, has been considered as one of the strongest dissolvents that can be taken with safety into the stomach; for the virtue of this composition has been thought considerably greater than the aggregate of the dissolving powers of the soap and lime water when unmixed.

How erroneous these ideas are, appears evidently, when we recollect the very easy decomposition of soap,

which renders it perfectly impossible that it should enter the circulating system, or indeed come into contract with the fluids even of the mouth, without being decomposed. As to the solution of soap in lime water, we may observe that it is only a clumsy way of exhibiting a solution of soda; for the soap is decomposed, an insoluble soap of lime is formed, and the soda remains in solution. The internal use of soap should therefore be confined, in our opinion, to the giving form to other substances which are not decomposed by it, and to decompose metallick poisons when they have been taken into the stomach. For this last purpose, a teacupful of a solution of soap, in four times its weight of water, may be drank every three or four minutes, until a sufficient quantity be taken.

Applied externally, it is a very powerful detergent, and combines the stimulating properties of the alkali with the lubricating nature of the oil. In this way it often proves a powerful discutient, and a useful application to sprains and bruises. A weak solution of it in water forms an excellent injection in virulent gonorrhœa.

Scilla Maritima. *Squill.* The root.

The squill is a perennial bulbous rooted plant, which grows wild on the sandy shores of Spain, Portugal, and the Levant. The best sea-onions ought to be sound, fresh, and to contain a viscous juice; they are nauseous, bitter, and, if much handled, are so acrid as to ulcerate the skin. It is more commonly met with in the shops, in the form of dried scales, which should be brittle, semi-pellucid, smooth, but marked with lines, and when chewed, should feel tenacious, and taste very bitter, without manifest acrimony.

The active constituent of the squill is the acrid principle; and, therefore, it becomes almost inert by drying, or by being kept too long in the form of powder. The squill is a powerful stimulant, promoting the discharge of urine; and if the patient be kept warm, a profuse perspiration.

It is chiefly employed in cases where the organs of respiration are clogged, or oppressed with mucus.

When combined with nitre, in the proportion of from five to ten grains of the dried root, with a double quantity of nitre, it has been greatly extolled for its efficacy in dropsical swellings, and in inflammation of the kidneys.

If the squill be taken in a large dose, it operates as an emetick; and, in some persons, as a purgative. In some cases it produces even strangury, bloody urine, inflammation, and erosion of the stomach. In smaller doses, however, it proves a useful expectorant and diuretick, and is peculiarly serviceable in phlegmatick habits, where the lungs are oppressed with viscid matter.

Squills combined with calomel, two grains of the former to one grain of the latter, form one of the most valuable remedies in dropsy, particularly hydrothorax.

The dose of squill is one or two grains, two or three times a day; and the most commodious form, unless when designed as an emetick, is that of a bolus, or pill: though when mixed with honey into an *oxymel*, it affords a useful medicine in obstinate coughs.

Scutellaria Lateriflora. *Blue Scull-cap. Hooded Willow Herb.* The plant.

The scutellaria is perennial, of which there are numerous species indigenous to the United States. The plant is found in great abundance on the banks of rivers and the borders of ponds; flowering in July or August. The stem is square, branched, and attains the height of from one to three feet. The leaves are opposite, narrow-pointed, on long foot stalks. The racemes are axillary and lateral, bearing small violet coloured blossoms, intermixed with small leaves. The calyx is hooded, or helmet-formed, from whence originated the generick name of scull-cap or scutellaria. It is now introduced here on account of its recently reputed efficacy as an antidote against the effects of *canine madness*. Should this plant ultimately prove a successful remedy for a disease so truly deplorable in its nature, and destructive in its consequences, no encomiums can surpass its merit even if recorded in letters of gold. The remedy was for many years a secret, in the possession of a family by the name of Lewis, in West Chester county, and in 1809 it was promulgated by Mr. R. Bowne, of New York, accompanied with strong evidence in favour of its antidotal powers. To the publication of Mr. B. [Med. Repos. Hexade 3. Vol. 2. No. 3.] was annexed an accurate engraving of this species of scutellaria, yet in his description he erroneously attached to it a specifick name belonging to a different species, the *scutellaria galericulata*.

This last species is to be distinguished by its axillary flowers in pairs, on pedicles from the alæ of the leaves, and pendulous.

The medical properties ascribed to scull-cap are those of an antidote against the effects of *canine madness*. In a publication entitled, Observations on hydrophobia, by the compiler of this work, a mass of evidence in favour of the antidotal powers of this plant has been recorded. Numerous gazettes and journals have also teemed with encomiums on its preventive powers, and from sources so respectable as to claim attention and confidence; and where it has been most known and employed, it has been the most highly extolled. Dr. Vandeveer, late of New Jersey, being in possession of the secret, acquired extensive popularity by his success; and he is said to have declared, that during his practice he has prevented upwards of three hundred persons from going mad, and that he never lost but one patient, to whom his medicine had been administered. From the high reputation, therefore, of scull-cap, perhaps surpassing that of any other remedy, practitioners ought to resort to the use of it on any occasion which may offer, either in relieving mankind from this awful malady, or in arresting the devastation among the brute creation. The following is the manner in which Mr. Lewis and Dr. Vandeveer prepared and administered the remedy. The leaves should be gathered when in flower, carefully dried and reduced to a fine powder, and put into bottles well corked for use. When a person has received a bite by a mad dog, he must take of a strong infusion of the leaves or powder, a gill four or five times a day every other day. The day it is omitted he must take a spoonful of the flowers of sulphur, in the morning, fasting, and at bed time, in new milk, and apply the pounded green herb to the wound every two hours, continuing the prescription for three weeks. For cattle or horses, he directs four times the quantity prescribed for a man.

I have recently received some favourable accounts of the efficacy of scutellaria as an antispasmodick in cases of spasm and other nervous affections; and as it has been exhibited in large quantities without producing unpleasant effects, it should be recommended in all cases of trial, to be administered in unlimited doses disregarding the use of the sulphur as above directed.

Secale Cornutum. *Ergot, or Spurred Rye.*

The history and properties of this very singular production have attracted the attention of naturalists and physicians for more than two centuries, and has recently excited an extraordinary degree of interest and speculation among the medical faculty of the United States. This substance is generated by a peculiar disease, which occasionally affects the grains of rye. It is by some naturalists called *clavus*, by others, *secale cornutum*. But by the French, this morbid substance is called *ergot*, from its resemblance to a cock's spur. It is an enlarged, elongated seed, projecting out of a glume; of a black, or violet colour, externally, and whitish within; and when dry, of a brittle texture. It is found of different lengths and size, some growing to an inch or more in length, while others are less than the genuine grains of rye. Its form is in general crooked, angular, larger in the middle than at the extremities, which are either blunt or pointed. Some ears produce a few grains of ergot, with small shrunk grains of rye intermixed, whilst others contain from ten to twenty ergots of different sizes. This diseased state of rye is said to be more frequent in newly cultivated ground; and in wet seasons, and moist situations, than in those more dry; and both winter and spring grain are supposed to be equally liable to this vitiated production. Wheat is also often ergotted, but this is always shorter and thicker than that from the ears of rye. Barley and oats are less frequently affected with this disease.

The deleterious character of ergot has been made a subject of particular investigation by European authorities. In numerous publications of former times, it has been announced, that in certain districts in France, and other parts of Europe, such large proportion of rye has been infested with ergot, as to render the bread made from it destructive to health and life. That at six different periods, subsequent to the year 1596, the inhabitants of those districts where ergot was most prevalent, were visited with epidemical diseases of a malignant and fatal nature; particularly violent spasmodick affections, and dry gangrene, or mortification of the extremities; destroying the flesh and ligaments, and leaving the bones bare. In the year 1709. no less than five hundred patients were in the hospital of Orleans, in France, afflicted with diseases supposed to be

in consequence of eating bread impregnated with spurred rye. By the same authorities we are apprized that various animals, such as sheep, dogs, swine, and poultry, being fed with ergot by way of experiment, died in great agonies; some convulsed, others mortified, and ulcerated. These circumstances naturally excited the greatest interest at the time, and occasioned the most assiduous investigation, which unfortunately, however, has not resulted in harmony of opinion relative to the real character of this morbid production. Opposed to the foregoing circumstances are numerous experiments, instituted by other respectable individuals, showing in a satisfactory manner, that ergot has been taken, as well by men as animals and birds, to a very considerable amount, without producing the least inconvenience. In this confused and equivocal condition, the subject was permitted to rest; nor do we learn that the medical properties of ergot were ever noticed or investigated by any European author. The merit therefore of designating this substance, as an agent capable of subserving valuable purposes in medicine, seems to have been reserved for American physicians; and Dr. John Stearns, of the state of New York, is undoubtedly entitled to the honour of being the first promulgator of its properties. This gentleman, in a letter to Dr. Akerly, published in the Medical Repository, in the year 1807, announced that ergot is capable of exciting a specifick action upon the uterus; that it greatly augments the power of that organ during the efforts of parturition; and in lingering and protracted cases, it speedily induces forcible pains, and greatly expedites delivery. Curiosity being thus excited, a few physicians were induced to test its virtues by practical experiment. In the year 1810, it was first introduced into this dispensatory, as a new article, deserving a place in the materia medica. The character of ergot, as a medicinal agent, may now be considered as fully established; and a majority of the physicians of our metropolis, and many others, have adopted the employment of it in promoting regular and efficient labour, where the natural efforts are deficient. By experience and observation, it is ascertained beyond controversy, that this medicine possesses a peculiar power of stimulating the gravid uterus, and increasing the feeble throes of parturition. Particular circumstances, however, are to be cautiously regarded in its administration; for if given in the early stage of labour, before the orifice of the uterus is suf-

ficiently relaxed and dilated, much mischief to both mother and child is to be apprehended. The powerful and continued efforts of the uterus, from the effects of a full dose of ergot, prevents the retreat of the child's head after being advanced, and the unceasing pressure has too often been the means of destroying the child. Either preternatural presentation, deformity of the pelvis, or rigidity of the muscular parts, are obstacles to delivery, which ergot has no power to remove; and if administered, its effects must inevitably prove injurious to the mother, and greatly endanger the life of the child. It is obvious, therefore, that the aid of ergot is indicated, and may be given with safety in those cases only where no rigidity exists, and where the labour has been lingering and long protracted, merely from the feeble and unfrequent uterine efforts. In the first birth it is seldom requisite or proper; nor should this powerful agent be administered by inexperienced or imprudent acouchers. Besides its beneficial effects as a parturient, ergot is endued with a peculiar property of constringing the uterine vessels, and restraining an undue hæmorrhage after delivery; and even the lochial discharge is often diminished by its use, but without any ill effects resulting. In an ingenious dissertation, read before the Massachusetts medical society in June, 1813, by Oliver Prescott, M. D. relative to the merit and properties of this article, the author observes: "the singular property of the ergot, to diminish the enlarged cavity of the uterus, is never more strikingly exemplified than when its agency is employed to restrain those floodings which sometimes appear in the early months of pregnancy, when the action of gestation has ceased, and abortion must follow. In such cases it speedily excites in the uterus such energetick action, that its contents are soon expelled, and the hæmorrhage ceases." Among the extraordinary qualities of ergot, none is more surprising than its almost instantaneous operation and effect. Dr. Prescott noticed the precise time in twenty cases; "in two of them the increased strength of the pains, and the continued action, commenced in seven minutes from the time the decoction was taken. In one case it was eight minutes, in seven it was ten, in three eleven, and in three others fifteen minutes. In the four remaining cases there was no apparent operation until twenty minutes had expired." The form in which Dr. Stearns administered ergot, is that of powder, to which he applied the appellation of *pulvis parturiens*, in doses of

from five to ten or fifteen grains; but later experience evinces that the decoction or infusion is to be preferred. Half a drachm to four ounces of water, one third of which is given, and the dose repeated in twenty minutes if necessary. An over dose of ergot in any form will sometimes excite vomiting; and Dr. Prescott has judiciously suggested a more eligible mode, that of giving a table spoonful of the decoction only once in ten minutes, as inducing a more temperate, though efficient action; and, in his opinion, a cautious direction of its powers cannot be too strongly recommended. In a few instances it has failed to exert any effect as a parturient, and in male subjects it has on trial proven inert. Another valuable property, recently discovered in ergot by practical experiment, is that of an efficacious emmenagogue, when employed in amenorrhœa. Dr. J. Randall, of Boston, exhibited it successfully in six out of seven cases of this disease.* One of his patients took six ounces, each ounce being boiled in a quart of water, down to a pint. In another instance, one ounce relieved his patient the first, and the same quantity the second time, and two ounces at the third period. Four others were completely cured by taking one ounce each, in the quantity of half an ounce per day. In his unsuccessful case, half an ounce was taken for four successive days, without relief and without injury. The only symptoms produced in the seven patients abovementioned, were headache, increased heat of body, and occasional pain in the hypogastrick region. In the volume just quoted, p. 247, an instance is related by Dr. Henry S. Waterhouse, of menstrual retention in a patient aged sixteen years. She had been under a course of the usual remedies, and was labouring under hæmoptysis, and various chlorotick complaints of an alarming nature. After venesection and the use of a cathartick, she was directed to take the saturated tincture of ergot, in doses of twenty drops, three times a day; and this, without any other medicine, effected a cure in about three weeks. The same intelligent writer, p. 248, details a very singular and interesting case of puerperal convulsions, with dreadful spasmodick contractions, in which ergot operated like a charm, and almost instantaneously rescued the suffering patient from the jaws of death. In a severe case of hysteria, where the paroxysms recurred every twenty minutes, and

*See New Eng. Med. Journal, vol. v. p. 162.

which had baffled all the usual remedies, twelve grains of ergot, in decoction, instantly arrested the paroxysm; and a second dose, half an hour after, removed every complaint. Thus it appears that ergot is a very important article in the materia medica, in every view, as it accelerates labour, discharges the placenta, restrains uterine hæmorrhage, and is a powerful emmenagogue. "The ergot of wheat," says Dr. Bigelow, (Med. Journal, vol. v. p. 163,) "has been the subject of a few trials, which serve in some degree to establish its affinity to that of rye. Its taste is equally nauseous, and somewhat more unlike that of the original grain. I have seen it occasion nausea in a dose of a scruple, and vomiting when a drachm had been given. In some cases of labour, it has evidently increased the uterine efforts; in one it produced no effect." Future experience may improve our knowledge of the various properties of this production. In two instances, ergot is stated to have been administered with particular views, during the early stage of pregnancy. In one case, about four drachms were taken within a few days; the consequence was regular pressing down pains, resembling the severest throes of parturition; and these recurred with every repetition of the medicine, yet on examination, the os uteri was not much dilated. In neither case was the natural term of gestation interrupted by the operation of the medicine. The fact has long been known among our farmers, that rye itself possesses a quality of inducing abortion in females of the animal tribe; and they carefully withhold that grain from such, during their periods of gestation. An accusation has recently been brought against ergot, as having an agency in producing the fatal epidemick called *spotted fever*. Attempts to vindicate or to invalidate the imputation, might be construed to imply a "zeal without knowledge," since the subject is confessedly involved in deep obscurity, and we are favoured only with the feeble light derived from speculative knowledge, and doubtful assumption. Suffice it here to observe, as a pertinent fact, that ergot has been taken with impunity, or with temporary inconvenience only, to the amount of six or more ounces; and it is not presumable that this article is often so abundant that individuals are liable to receive a greater quantity in any one season, by way of food. It is well known also, that spotted fever has been prevalent in situations where spurred grain has seldom, or perhaps in no

instance been produced. The position is nevertheless to be regarded, that morbid or damaged grain may predispose to, if not actually prove the generating cause of diseases; and no one will hesitate to recommend to farmers and others, the greatest vigilance in separating ergot from the pure grain intended for use; and it will be profitable for the farmer to collect the ergot and sell it to druggists.

SESAMUM ORIENTALE. *Oily Grain. Benne.* The leaves and seeds.

This, originally an African plant, has become well known by the name of *benne* in South Carolina and Georgia, or the vangloe of the West Indies. It is an annual plant, rising with an herbaceous four cornered stalk, two feet high, sending out a few short side branches; the leaves are oblong, oval, a little hairy, and stand opposite. The flowers terminate the stalk in loose spikes; they are small, of a dirty white colour, shaped somewhat like those of foxglove. After the flowers are past, germen turns to an oval acute pointed capsula, with four cells filled with oval compressed seeds, which ripen in autumn. Of late years the seeds have been introduced into the states of Georgia and South Carolina, by the African negroes, where the plant succeeds extremely well; and they boil a handful of the seeds with their allowance of Indian corn, which forms a nourishing food. But the excellency of these seeds consists in their yielding a larger proportion of oil than any other vegetable with which we are acquainted. One hundred weight of seed will produce ninety pounds of oil of an equal and even preferable quality to Florence oil. It will keep good many years without contracting any rancid smell or taste, and when the warm taste of the seed, discovered in the oil when first drawn, is worn off, it becomes quite mild, and is found to be a pleasant and agreeable substitute for all the purposes of salad oil. The benne oil in some parts of the southern states is esteemed as a gentle laxative, in those cases where the more nauseous castor oil is usually employed. It also burns well in lamps. The leaves of this plant by infusion or decoction are found to afford an excellent mucilage; well adapted to all the intentions of that class of remedies, and in 1803, was used with the most marked good effect, in an epidemick dysentery in South Carolina. Consider-

ing, therefore, the great utility and importance of the benne plant, its cultivation by our patriotick planters cannot be too strongly recommended.

SINAPIS ALBA. *White Mustard.*
SINAPIS NIGRA. *Black or common Mustard.* } The seeds.

These plants are both annual, both grow wild in England, and possess similar virtues. They produce small round compressed seeds, which have an acrid bitterish taste, and a pungent smell when reduced to powder. The common mustard has blackish seeds, and is more pungent than the white. They impart their taste and smell in perfection to aqueous liquors, while rectified spirit extracts extremely little of either: the whole of the pungency arises with water in distillation. Committed to the press, they yield a considerable quantity of a soft insipid oil, perfectly void of acrimony; the cake left after the expression, is more pungent than the mustard itself.

The imported mustard, so common at tables, and which is generally preferred to our own, is the pulverized seed of the black species; the difference consists only in the preparation of the powder.

The seeds unbruised are frequently given in palsies and chronick rheumatisms, and are found beneficial. They may be taken in the quantity of a table spoonful or more, and will gently relax the bowels. Rheumatick pains in the stomach are often relieved by taking them in brandy. The powdered seeds, with crumbs of bread and vinegar, are made into cataplasms, and applied to the soles of the feet in fevers, when stimulants are necessary. They are also topically applied in fixed rheumatick and sciatick pains. Dr. Withering says, wherever we want a strong stimulus, that acts upon the nervous system without exciting much heat, we know none preferable to the mustard seed. An infusion of the seed, given in large quantities, vomits; but, in smaller doses, operates as an aperient and diuretick. Mustard whey, with wine, is used as a drink in fevers. Its acrimony is said to consist in an essential oil.

Mustard whey is made by boiling one and half ounce of the bruised seeds in a pint of milk, and as much water, till the curd be perfectly separated. This is perhaps the most elegant form in which mustard can be exhibited. A little sugar may be added, and an ordinary teacup full

given four or five times a day in cases of low nervous fever, greatly warms and invigorates the habit, and promotes the different secretions.

SMILAX SARSAPARILLA. *Sarsaparilla.* The root.

This root is brought from the Spanish West Indies. It consists of a great number of long strings hanging from one head: the long roots, the only parts made use of, are of a blackish colour, on the outside, and white within, about the thickness of a goose quill.

They have a glutinous, bitterish, not ungrateful taste, and no smell. It was first brought into Europe by the Spaniards, about the year 1563, with the character of being a specifick for the cure of the lues venerea, a disease which made its appearance a little before that time; and likewise of several obstinate chronick diseases. This article has been unjustly decried by dispensatory writers as an inert mucilaginous substance; and it has been said that the diaphoresis which it is sometimes supposed to produce, is entirely owing to the warm and diluent regimen employed at the same time. We find nevertheless, that it is retained in our pharmacopœia, and is very frequently prescribed in present practice. Sarsaparilla is unquestionably a remedy of considerable utility, and as an auxiliary medicine in the cure of syphilis and various chronick affections, it is held in estimation by our most respectable practitioners. It appears by a paper published in the Lond. Med. Repos. by Richard Battley, chemist, that the credit of this article has suffered by the improper manner in which it is commonly prepared for use. He asserts as the result of direct experiment, that its medical properties reside, exclusively, in the *cortical part;* and that such properties may effectually be disengaged by cold infusion in water; the root thus treated becomes a tasteless and inert substance. It follows, that when the cortical part has been materially injured, or when in the preparation of the medicine, the ligneous part of the root has been chiefly regarded, the remedy so prepared must be, in a great measure, if not wholly, inefficacious. Mr. Battley recommends as an elegant preparation, an infusion of the perfect root in cold lime water; a menstruum particularly calculated to improve its medical properties when administered to dyspeptick patients.

Sarsaparilla is found in abundance in the vicinity of the Ohio river, and in various parts of the United States.

Solanum Dulcamara. *Bitter Sweet. Woody-night Shade.* The stalks and leaves.

This plant flourishes most luxuriantly in moist and sheltered situations where the roots can have free access to water. The stalks are woody and brittle, climbing on fences and bushes, but if no shrubs in the vicinity, they creep extensively along the surface, and frequently strike new roots in the earth. The flowers appear in June and July, and are of a purplish colour. The berries are oval, of a bright scarlet colour, and continue to hang in bunches after the leaves have fallen in autumn. The taste of the twigs and roots, as the name of the plant expresses it, is both bitter and sweet; the bitterness being first perceived, and the sweetness afterwards. The solanum dulcamara has obtained some reputation as a remedy in asthma, incipient phthisis, chronick rheumatism, jaundice, herpes, and secondary syphilis. But more recently it has manifested its superiour efficacy in the cure of inveterate cutaneous diseases. Drs. Willan and Bateman, in treating of diseases of the skin, furnish ample attestations to the great utility of this medicine in the cure of cutaneous affections of an inveterate character. Dr. Chrichton, physician to the Westminster hospital, having employed dulcamara for a number of years, states in a letter to Dr. Willan, that out of twenty-three cases of lepra græcorum, two only had resisted the action of this remedy. His method of administering the dulcamara is as follows. Take of stalks of dulcamara one ounce; water one pound and half; boil to a pound and strain when cold. Of this decoction the patient took two ounces at first, morning, noon and night, but the quantity was afterwards increased until it amounted to a pint per day. At the same time the skin was ordered to be washed with a stronger decoction, which proved an auxiliary to the cure. If it produced syncope, palpitation of the heart or giddiness, the dose was diminished, or some aromatick tincture added. The good effects of the remedy were seldom perceived until after the first eight days. Dr. Bateman administers the dulcamara in the same way with that just described; and when there is a degree of torpor in the superficial vessels, he employs a strong decoction of the

leaves and twigs as a lotion; but if there is any inflammatory disposition, this and every other external stimulus must be prohibited. We add the observations of professor Bigelow, who has employed the bitter sweet in a number of cutaneous affections, and found it to be a valuable auxiliary to mercury in the treatment of syphilitick eruptions, and he has known herpetick eruptions to yield to its internal and external use. Dr. Bigelow has known the American plant, when gathered in full vigour, to produce vomiting in a dose of a few grains of the powdered leaves, and by a small cupful of the decoction. The strength of the plant seems to vary in some degree with the time of gathering, and mode of preserving. From his own observation he is induced to consider the appearance of slight narcotick symptoms as an evidence of the goodness of the medicine, and as a criterion for regulating the dose. In the case of delicate constitutions, the commencing dose of the decoction should not exceed an ounce, which may be afterwards increased according to circumstances. The addition of cinnamon renders the decoction less apt to offend the stomach. The bark of the root of bitter sweet, simmered moderately for several hours in fresh butter or cream, forms one of the most efficacious ointments to be applied to excoriated parts, and is particularly famous for the cure of excoriations, and soreness of the nipples of nursing women. The ointment is of a beautiful yellow colour, and a mild and useful application.

Solidago Odora. *Sweet Scented Golden Rod.*

The sweet scented golden rod, says Dr. Bigelow, grows in woods and fields, throughout the United States, and flowers in September. It has a smooth appearance, and is among the smaller species of its family. The root is woody, much branched and creeping. Stem slender, from two to three feet high, smooth or slightly pubescent below, pubescent at top. The leaves are linear-lanceolate, closely sessile, broad at base, entire, acute, with only the mid rib distinct, rough at the margin, but otherwise smooth and covered with pellucid dots. The flowers grow in a compound, panicled raceme, with each of its branches supported by a small leaf. The leaves of the solidago odora have a delightful fragrant odour, partaking of that of anise and sassafras, but different from either. When subjected to distillation, a volatile oil, possessing the taste

and aroma of the plant in a high degree, collects in the receiver. The claims of the solidago to stand as an article of the materia medica, are of an humble but not despicable kind. We import and consume many foreign drugs, which possess no virtue beyond that of being aromatick, pleasant to the taste, gently stimulant, diaphoretick and carminative. All these properties the golden rod seems fully to possess. An essence made by dissolving the essential oil in proof spirit, is used in the eastern states as a remedy in complaints arising from flatulence, and as a vehicle for unpleasant medicines of various kinds. I have employed it to allay vomiting, and to relieve spasmodick pains in the stomach, of the milder kind, with satisfactory success. From its pleasant flavour, it serves to cover the taste of laudanum, castor oil, and other medicines, whose disagreeable taste causes them to be rejected by delicate and irritable stomachs. (Medical Botany.)

SOPHORA TINCTORIA. *Linn.* } *Wild Indigo. Indigo*
PODALYRIA TINCTORIA. *Mich.* } *Weed.*

The root and plant.

This vegetable is indigenous, and supposed to be exclusively American. In Dr. Cutler's catalogue it is called *indigofera*, and it is sometimes known by the name of *broom*, but more commonly *indigo weed*. It is perennial, growing in great abundance in almost every barren pasture, and in woods. The stalk rises to two feet or more, sending off numerous branches. The leaves are small, ternate, inversely heart shaped, and sessile. In July and August all its branches display, butterfly shaped, golden coloured blossoms, which render the plant very conspicuous. The seed vessels are inflated, containing numerous seeds. The root is ligneous, rough, and irregular in shape, of a dark brown colour externally, and sending off many long slender branches. Its taste is unpleasant, subacrid, and nauseous, very similar to that of ipecacuan. The particular medical properties of indigo weed are yet to be ascertained; that it possesses great activity is unquestionably true; those who in the spring season have made the young shoots a substitute for asparagus experienced its drastick evacuating powers. In the hands of some physicians it is found to operate in a large dose, with much severity as an emetick and cathartick. But a weak decoction of the

root has frequently been given with the effect only of a mild laxative. A decoction of the bark of the root has, it is said, been made known by an empirick experienced in its use, as a remedy in scarlatina anginosa; and its employment has been extended in a few instances to typhus or putrid fever with such good effect as to encourage farther trials. An experienced physician considers it as an excellent antiseptick and febrifuge, preferring it in some fevers to Peruvian bark. As an external application, its antiseptick qualities ought to be more extensively known. In the form of fomentation or cataplasm it has proved eminently beneficial when applied to phagedenick and gangrenous ulcers, especially if the decoction be administered internally at the same time.

Some experiments have been made with the pulverized root in doses of twenty to thirty grains, for the purpose of ascertaining its emetick and cathartick powers, but without a very favourable result. It appears to possess valuable antiseptick properties, as an external application to vitiated ulcers of almost every description; an infusion of the root has surpassed in efficacy any other remedy which I have ever employed. In aphthous and other ulcers of the mouth, sore nipples, chronick sore eyes, and in various painful ulcers, discharging acrid matter, the assuaging and healing qualities of an infusion of wild indigo root has answered every expectation in practice. Impressed with the assurance of its great utility, and solicitous to diffuse an experimental knowledge of it more extensively, I was induced to furnish several medical friends in Boston with the root, to be used in the marine hospital and in the almshouse, particularly in cases of syphilitick ulcers; nor has the result disappointed my sanguine expectations. In their hands it has proved extremely beneficial when applied to venereal ulcers, mercurial sore mouth, and other ulcerous affections. In malignant ulcerous sore throat, no opportunity has presented for trial, but the happiest effects are anticipated in that disease, as well as others of a putrid nature. An ointment may be made by simmering the fresh root in hogs lard, or in cream, to be applied to burns and ulcers. The virtues of the root appear to be considerably diminished by long keeping.

A violet or pale blue colour has been prepared from the leaves and small branches of this plant, and used

as a substitute for indigo. The leaves turn black when dried.

SPIGELIA MARILANDICA. *Carolina Pink.* The root.

This plant is perennial, and grows wild in most of our southern states. The roots are celebrated as an anthelmintick, particularly for the expulsion of lumbrici from the alimentary canal. Every part is possessed of the anthelmintick property, though the root is most active. It is commonly administered in the form of infusion; an emetick is generally premised, and its purgative effect assisted by some suitable addition, as senna or jalap. By some the powdered root is directed in doses of ten or fifteen grains; while others prescribe it in drachm doses. But it should be observed that according to the late Dr. Lining, of Charleston, when exhibited in large doses, and without proper precautions, it sometimes produces very singular and distressing effects upon the nervous system, such as vertigo, pains over the eyes, and dilated pupil. As a vermifuge, spigelia has acquired a superiour confidence, and it often affords relief and effects a cure, in cases where no worms are discharged. It is supposed by Dr. Barton, that it will be found highly useful in some febrile diseases of children, unaccompanied by worms, especially in the insidious remittent which so frequently lays the foundation of dropsy of the brain. It should be observed, that the efficacy of spigelia is greatly impaired by keeping more than six months.

SPIRÆA TRIFOLIATA. } *Indian Physick. Ipecacuanha.*
GILLENIA TRIFOLIATA. } *Beaumont Root.*

The bark of the root.

This shrub grows plentifully on mountains and hills, in all parts of the United States, and is one of the few active plants of the class icosandria. It flowers in June and July. The root is perennial, and sends up one or several stems which rise to the height of two or three feet, are round, and branched above, and usually of a reddish colour. The root, the part employed, consists, like that of the officinal ipecacuan, of a bark and woody part. The active power seems to reside exclusively in the bark. It is a safe and efficacious emetick, in doses of

about thirty grains. It also seems to possess a tonick power, and has accordingly been thought peculiarly beneficial in intermittent fevers. It is sometimes very injudiciously employed by the country people, insomuch that they are obliged to apply for medical aid, to remove the debility induced by the large doses of the root which they employ. Another species, it is said, grows in Kentucky, which is still more valuable as an emetick, than the one under notice.

Spongia Officinalis. *Sponge.*

Sponge is principally found in the Mediterranean and Red Seas. It was long supposed to be a vegetable production, but is now universally allowed to belong to that remarkable class of animals called Zoophytes, which are negatively characterized by Cuvier, as having no vertebræ, no sanguiferous vessels, no spinal marrow, and no articulated limbs.

Sponge is a soft, light, very porous and compressible substance, which readily imbibes water. It is of extensive utility in domestick economy, medicine, and surgery. As it strongly adheres to the orifices of wounded vessels, it is advantageously employed as a styptick; often preventing the effusion of blood more effectually than the puff ball or *agaric*.

From its property of imbibing and distending by moisture, it is sometimes made use of as a tent for dilating wounds and ulcers. To fit it for these intentions, the sponge is immersed in melted wax, and subjected to pressure till cool. In this state it may be easily formed into proper tents, so as to be introduced where necessary. And from the gradual melting of the wax in consequence of the heat of the part, a dilatation of course takes place.

Sponge, cut in pieces, and burnt in a close iron vessel, till it become black and friable, and afterwards reduced to a very fine powder, has been successfully administered internally, in scrofulous complaints and cutaneous diseases, in doses of one scruple and upwards; it is also considered as a *specifick*, on account of its efficacy in removing the glandular swellings of the neck, known under the name of *bronchocele*. But the virtues of burnt sponge probably depend on the presence of a little alkali. It also contains charcoal; and its use may be entirely su-

perseded by these substances, which may be obtained in other ways, and at a much cheaper rate.

If sponge be cut in small pieces, fried, or dipped in honey, or salt butter, and given to rats, it distends their bowels, and effectually destroys those animals.

STANNUM. *Tin.* The filings and powder.

Tin is one of the imperfect metals, and is found most frequently mixed with other metallick ores. It is now only used as an anthelmintick, especially in cases of tænia, and probably acts mechanically.

Tin is reduced to powder, consisting of small rounded particles, by heating it nearly to its melting point, and agitating it briskly. This powder is often employed as a remedy against worms, particularly the flat kind, which too often elude the force of other medicines. The general dose is from a scruple to a drachm; but Dr. Alston assures us, in the Edinburgh essays, that its success depends on its being given in much larger quantities. He directs an ounce of the powder on an empty stomach, mixed with four ounces of molasses; next day, half an ounce; and the day following, half an ounce more; after which, a cathartick is administered. He says the worms are usually voided during the operation of the purge, but that pains of the stomach occasioned by them, are removed almost immediately upon the first dose of the tin. This practice is sometimes successful in the expulsion of tænia, but by no means so frequently as Dr. Alston's observations would lead us to hope.

STATICE CAROLINIANA. *Marsh Rosemary. Lavender Thrift. Sea Lavender.* The root.

This is well known in the New England states. It is indigenous and perennial, growing on the sea shore, in salt marshes; and the fissures or clifts of rocks near the sea coast: it is in flower from July to September. The stem is naked, branched, and about a foot high. The radical leaves are long, pointed, and grow on foot stalks. The flowers are blue, and grow on long spikes on the tops of the branches. The roots of this plant are powerfully astringent. A decoction of them is given and used as a gargle with success in cankers and ulcerated sore throats.

We learn from an authentick source, that the late Dr. Hews, of Providence, held the root of this plant in high estimation in cases of aphthous states of fever, accompanying dysentery, ulcerous sore throats, or *scarlatina anginosa*. He valued it as the greatest antiseptick he was acquainted with, and said he could administer it in cases where the bark was inadmissible.

Dr. William Baylies, of Dighton, in a communication to the Massachusetts medical society, makes favourable mention of this root from his experience in the ulcerated sore throat, as it appeared in that town in 1785 and 1786.

Dr. Mott, medical professor in the university of New York, has made this plant a subject of particular investigation, and found the astringency fully equal to that of galls, and ink made from equal quantities of the two, similarly treated, was equal in blackness. He asserts that in the chronick stages of dysentery, after the inflammatory diathesis, great tenesmus, &c. are removed, a strong decoction of the root has restored patients to health, after various tonicks and astringents had been used to no effect. Professor Bigelow of Boston, bestows on the root of marsh rosemary the credit of being one of the most intense and powerful astringents in the vegetable materia medica, and commends its astringent and antiseptick quality as being peculiarly suited as a topical remedy in aphthæ and other ulcerative affections of the mouth and fauces.

Strychnos Nux Vomica. *Nux Vomica. Vomic Nut.*

The seeds.

This very deleterious article has long been neglected in medicine, but is now admitted into our national pharmacopœia. The following ample and satisfactory statement is copied from Dr. Dyckman's Edinburgh new dispensatory.

"A large tree, a native of the East Indies. The seed of the fruit or berry of this tree is the officinal *nux vomica*, which is roundand flattened, about an inch in breadth, and near a quarter of an inch thick, with a prominence or sort of umbillicus towards the centre on both sides. Externally it is covered with a sort of woolly matter, or silky threads, radiating from the centre to the circumference, and of a gray, yellowish, transparent, or blackish colour: internally it is so hard and tough, that it cannot be pul-

verized by beating, but requires to be filed down. To the taste it is intensely bitter, but discovers little or no smell. According to the analysis of M. Chevreul, it contains—acidulous malate of lime, gum, vegeto-animal matter, bitter matter, fixed oil, colouring matter, earthy and alkaline salts, woody hairs, and wax, which appears to preserve the perisperm from humidity. An alcoholick tincture of it is considerably more bitter than the aqueous infusion; hence proof spirit is considered its best menstruum. Nux vomica is a powerful narcotick poison, especially to brute animals, nor are instances wanting of its deleterious effects upon the human species. Its operation as a narcotick, is well exemplified in its effects upon dogs and other animals, when it is given as a poison. Extreme anxiety, a sense of stricture in the chest, laborious respiration, tremblings, coma and convulsions, are among the symptoms that usually precede the fatal spasms, tetanus, immobility of the thorax, and consequent asphyxia, with which this drug commonly extinguishes life. On dissection, no marks of inflammation or local affection are discoverable in the stomach or intestines. The effects of the nux vomica, upon different animals, and even upon those of the same species, are not always certain, nor in proportion to the quantity taken. With some animals its effects are manifest almost instantaneously; with others not till after some hours. Of the extract, two grains, and of the powdered nut, twelve grains have been found sufficient to destroy small dogs. A horse died in four hours after taking one drachm of the seed in a half roasted state. Hoffman reports that a girl, aged ten years, to whom fifteen grains were exhibited at two doses, for the cure of an obstinate quartan fever, perished in a short time; after having experienced extreme anxieties, and having made some efforts to vomit. The nux vomica has been recommended as an antidote to the plague, as a febrifuge, as a vermifuge, and as a remedy in mania, epilepsy, hypochondriasis, hysteria, canine madness, gout and rheumatism. In dysentery and intermittent fevers it has been given in a dose of five grains, twice a day; but from the hazard attending its use, it has not been established in practice, nor received into the pharmacopœias; and in the drug stores it was seldom kept, except as a poison for rats, and some kind of vermin. Lately, however, this article has come into notice in France, as a powerful agent in the treatment of paralysis. It is on account of its reported efficacy as a remedy in

this common and destructive form of disease, that I have mentioned it in this work; and if future and more extensive trials shall completely confirm the encouraging proofs that have already been given of the virtual properties of the nux vomica, there can be no doubt of the propriety of introducing it into general practice, and of bestowing upon it the first station in the list of remedies hitherto employed in the management of paralysis. It is stated to have been given in a number of cases, and that it had rarely failed of affording relief when the head was not materially affected. In paralysis produced by organick causes, and particularly in that arising from compression of the brain or of the spinal marrow, and from lesions of the nervous system, the indiscreet application of any kind of stimulant or exciting remedy, would, no doubt, be attended with an exasperation of symptoms. In the treatment of these, the use of the nux vomica should not be admitted; but those paralytick affections brought on by excess of venery, of spiritous liquors, of narcoticks, by metallick influence, by passion, by terrour, and rheumatism, by sympathetick irritation, by wounds and acute diseases, are all considered proper cases for its employment.

Delisle and Magendie, by their experiments on different animals, had proved that the nux vomica possessed the power of creating in the human species, as well as in brutes, an artificial tetanus. It is this operation of the nux vomica, as we learn from a memoir by M. Fouquier, of Paris, that first suggested the use of it in paralysis, on the principle that a temporary tetanick action might become useful in that disease, by creating a new action in the muscles of the palsied limbs. M. Fouquier states, that in less than an hour, and not later than one or two, the effects of the medicine are felt; and according to the dose, strong and permanent contractions are experienced in the voluntary muscles, and by the continuance of the remedy, the action increases to a degree of tetanick stiffness. As a singular fact it is stated that the spasmodick contraction is excited in the palsied muscles in preference to the healthy ones, and in proportion as they are more deprived of motion or feeling. Four grains of the powdered nut, or two of the extract, given three, four, five, and six times a day, are considered the most appropriate doses for an adult. These remove, by their gradual operation, the apprehension of any danger, while they give time for

the formation of such symptoms as are necessary to regulate the continuation of the remedy, which should never be pushed so far as to produce general tetanus or painful startings. The aversion of patients to the use of the nux vomica, on account of the terrour of tetanick spasms which it produces, is stated by M. Fouquier, to be one of the greatest difficulties which we have to encounter in the use of this remedy, and yet in due proportion, he says, it has never proved dangerous. The alcoholick extract, which can be kept unaltered in a dry form, appears to be most used. This is prepared by macerating the pulverized nut in rectified spirit for two or three days; and then evaporating the filtered tincture in close vessels at a very moderate temperature. When properly prepared, it is intensely bitter. A union of the aqueous and alcoholick extracts, would unite more completely the component principles of this drug.

Styrax Benzoin. *Benjamin Tree.* The balsam, called benzoin.

This balsam, obtained by exudation, is in brittle masses, composed of brown and white fragments; its smell is fragrant; it has little taste. It consists almost wholly of resin, and is therefore nearly entirely soluble in alcohol. It likewise contains a portion of a peculiar acid, which, as it exists in greater quantity in it than in any other vegetable matter, is named acid of benzoin (flowers of benzoin.) It is obtained from it by sublimation; is in white, brilliant scales; retains the flavour of the benzoin; and, with acidity, has also a degree of pungency. Benzoin is rarely employed in medicine: its acid is used as an expectorant in asthma, in a dose of ten or fifteen grains, but it is probably a medicine of little power. It enters into the composition of the ammoniated and camphorated tinctures of opium.

Storax resembles benzoin in its virtues. It was formerly used as an expectorant, but is now little regarded.

Sub Acetis Cupri. *Sub Acetite of Copper. Ærugo. Verdigris.*

This substance is a kind of rust of copper, prepared by corroding the metal with vinegar. It is rarely employed internally, but being the basis of an empirical preventa-

tive of hydrophobia, the author of it asserts, that he is in the practice of giving not less than one hundred and eighty grains conjoined with half an ounce of calomel for one dose. And according to Dr. Parr, four drachms of this very active substance have been swallowed without any other inconvenience than the present vomiting, yet in smaller doses it excites the most violent symptoms, and often proves fatal. Applied externally it proves a mild escharotick, and is employed advantageously to callous edges, and fungous flesh in wounds, and to scorbutick ulcers of the mouth, and deserves to be tried in cancerous sores. Verdigris has been successfully applied to incipient chancres; by its acting as a caustick, and completely destroying the diseased surface. Equal parts of verdigris and powdered savine will effectually remove warts and other excrescences from the skin, and the same compound is the best application to promote the discharge from issues.

Sub Boras Sodæ. *Sub Borate of Soda. Borax.*

This salt, consisting of boracic acid, united with soda, (the soda being slightly in excess) is brought from Thibet, where it is found in a native state. It is purified in Europe by crystallization; its taste is cool; it is soluble in eighteen parts of cold and six of hot water. It is decomposed by several of the acids.

The medicinal virtues of borax have not been sufficiently ascertained by experience; it is supposed to be, in doses of half a drachm or two scruples, diuretick, emmenagogue, and a promoter of delivery. A solution of borax, in water, is the best of all applications, for healing aphthous crusts, or the thrush in the mouths and fauces of children; or it may be applied for the same purpose in the form of powder mixed with sugar. There is not perhaps a more balsamick, or useful application to sore nipples, or chopped lips and hands in winter, than a few grains of borax dissolved in warm water, with the addition of a little pure honey. There are strong reasons to believe, that the virtues of borax are much greater than they are in general supposed to be; and that it may be more extensively used with advantage. As an astringent gargle in cases of salivation by mercury, and in other affections of the mouth and throat, a mixture of borax

with water and honey is undoubtedly superiour to every other.

Succinum. *Amber.*

This is a solid, brittle, bituminous substance, dug out of the earth, or found upon the sea shores; particularly along the coast of Polish Russia and Pomerania. It is of a white yellow, or brown colour; sometimes opaque, sometimes very clear and transparent. By distillation it affords a little acetous acid, an essential oil, and a peculiar acid, named from it, succinic.

Amber is regarded only for the empyreumatick oil and acid obtained from it.

Super Sulphas Aluminæ et Potassæ. *Super Sulphate of Alumina and Potass. Alum.*

This a salt composed chiefly of argillaceous earth and sulphurick acid, the acid being in excess. It likewise contains a smaller portion of potass, and frequently of ammonia. It is found in a native state, or is prepared by exposing alum ores, which are native compounds of argillaceous earth and sulphur, to atmospherick air; the sulphur absorbing oxygen, forms sulphurick acid, which unites with the argillaceous earth, and the formation of the alum is completed by the addition of potass or ammonia. It is then obtained pure by crystallization.

This salt is in large transparent masses; it has a styptick taste, with a degree of sweetness. From the excess of its acid, it reddens the vegetable colours. It is soluble in eighteen parts of cold, and in less than two of boiling water. The variety termed roche or rock alum (alum rupeum) has a reddish colour, from the presence of a portion of iron; but its other properties are the same as those of common alum.

Alum, from its astringent power, is employed to check hæmorrhagies and serous evacuations; it is thus given in menorrhagia, leucorrhœa, and diabetes. It has likewise been used, though less frequently, in intermittent fever, malignant small pox, and colica pictonum. Its dose is from five to fifteen grains. The addition of an aromatick is generally necessary, to prevent it from exciting nausea, when it is given in the solid form. The best form of administering it, however, is that of the alum

whey, prepared by adding two drachms of powdered alum to a pint of hot milk; the dose of this is three or four ounces. In uterine hæmorrhage, and in diabetes, this whey taken to the quantity of three or four ounces, three times a day, has been attended with very favourable effects.

It is also used externally, in astringent and repellent lotions and collyria. But burnt alum taken internally, has been highly extolled in cases of colick. In such instances, when taken to the extent of a scruple for a dose, it has been said gently to move the belly, and give very great relief from the severe pain. Burnt alum is applied externally, as a gentle escharotick, to fungous ulcers.

SULPHAS BARYTÆ. *Sulphate of Barytes. Ponderous Spar.*

This salt has been omitted in the list of the materia medica of the Edinburgh college; but they afterwards employ it for the preparation of the muriate of barytes. It is found in great abundance in many countries, either in a loose earthy form, or compact, or foliated, or striated, or acicular.

The foliated is in general the purest. Heated to redness with charcoal, it is converted into a sulphuret, and it may be decomposed either by boiling, or in a crucible, with the carbonates of potass and of soda. It contains about eighty-four of barytes, and sixteen of sulphurick acid and water.

SULPHAS CUPRI. *Sulphate of Copper. Blue Vitriol.*

This article is made by stratifying plates of copper with the sulphur; and, on slow combustion, the sulphurick acid corrodes the copper: the metal is then boiled in water, till the saline particles be dissolved; when, after repeated solution, and subsequent evaporation, the whole is reduced to the crystalline point.

The sulphate of copper has a strong, styptick, metallick taste, and is chiefly used externally as an escharotick for destroying warts, callous edges, and fungous excrescences, as a stimulant application to ill conditioned ulcers, and as a styptick to bleeding surfaces. Taken internally, it operates, in very small doses, as a very powerful emetick. Dr. Marryatt, an English physician,

employed greatly to his satisfaction the vitriolum cupri as an emetick in phthisical cases. Dr. Senter, late of Newport, considered blue vitriol as one of the most safe and efficacious emeticks in the same disease, joined with ipecacuan, that the materia medica affords; and advises from seven to ten grains of each, made up into pills, to be taken in the morning, fasting, without drinking any thing afterwards. The good effects of this prescription is amply attested by Dr. Thomas, author of Modern Practice, who has adopted it in many cases of incipient phthisis pulmonalis with infinite advantage. When given alone, the dose is from three grains to ten or fifteen, dissolved in two or three ounces of water. A vomiting is excited soon after it is received into the stomach, on which the patient may drink a pint of water. In phthisis pulmonalis the emetick is directed to be given every second or third day; and the same medicine is recommended in intermittent fever and epilepsy.

Sulphas Magnesiæ. *Sulphate of Magnesia. Sal Catharticus Amarus. Epsom Salt.*

This salt is found in mineral waters, whence it has been extracted, but is at present principally prepared by art, from the liquor remaining after the crystallization of muriate of soda (sea salt) from sea water, which holds a quantity of muriate of magnesia dissolved. It is commonly in needle-like crystals, and deliquescent; but when pure, it forms large, regular crystals, which are rather efflorescent. They are soluble in nearly an equal weight of water. Their taste is extremely bitter.

This salt is used as a purgative, in a dose of an ounce or more, dissolved in a large quantity of water. Though its taste is bitter, it has been remarked, that it remains better on the stomach than many other catharticks, especially when given in small repeated doses. Exhibited in this manner, it has been particularly recommended in ileus and colica pictonum. It is a mild and gentle purgative, operating with sufficient efficacy, and in general, with ease and safety, rarely occasioning any gripes, sickness or the other inconveniences with which purgatives of the resinous kind are too often accompanied. Some allege that this salt has a peculiar effect in allaying pain, as in colisk, even independently of evacuation.

Epsom salt may be manufactured from the bittern, or bitter water which remains in the vats, after the crystallization of common salts by evaporation. The Rev. Mr. E. Briggs, of Chatham, county of Barnstable, is probably the only person who has hitherto successfully attempted the manufacture of this domestick article. He deposits vessels containing the bitter water (leaden vessels are preferable) in a cellar, or other cool place, out of the influence of the sun; this salt will collect upon the bottoms and sides of them, in very considerable quantities, having the appearance of half melted snow: in this state it is to be laid aside until the weather becomes cold, and then crystallized afresh. The salt thus procured, is found to be genuine sulphas magnesiæ, and equal in quality to any imported from Europe.

SULPHUR SUBLIMATUM. *Sublimed Sulphur. Flowers of Sulphur.*

Sulphur is a simple, inflammable substance, found in nature nearly pure, and likewise in combination with several of the metals. The sulphur of commerce is the produce of volcanick countries. It is naturally mixed with earthy matter, from which it is freed by sublimation.

Pure sulphur is of a light yellow colour; is insipid; has a faint smell, when rubbed or heated; is very fusible and volatile; and, when heated in atmospherick air, burns with a blue flame, and suffocating fumes. It is insoluble in water or alcohol, but is dissolved by oils, and combines with the alkalis, several of the earths, metals, and metallick oxides.

Pure sulphur loosens the belly, and promotes insensible perspiration: it seems to pass through the whole habit, and manifestly transpires through the pores of the skin, as appears from the sulphurous smell of persons who have taken it, and from silver in their pockets imbibing a blackish cast, which is the known effect of sulphurous fumes. It is a celebrated remedy against cutaneous diseases, both given internally, and externally applied. It has likewise been recommended in coughs, asthmas, and other disorders of the breast and lungs; and particularly in catarrhs of the chronick kind. But it is probable, that the benefit derived from it in these cases, is principally, if not entirely, owing to its operation as a gentle laxative.

And with this intention it is frequently used with great advantage in hæmorrhoidal affections, and many other diseases in which it is proper to keep the belly gently open. The dose is two or three drachms, in honey or molasses.

SULPHURETUM ANTIMONII. *Sulphuret of Antimony. Antimony. Stibium.*

Antimony, in the modern nomenclature, is the name given to a peculiar metal. This metal is found in nature, most abundantly combined with sulphur; and to this ore, the name of antimony was once generally given. To distinguish it from the pure metal, it is named crude antimony, or more properly, native sulphuret of antimony, the simple name, antimonium stibium, being appropriated to the metal itself.

The native sulphuret is of a gray blue colour; has a shining surface, and striated texture. To free it from the earthy matters with which it is mixed, when dug from the earth, it is fused. Its lustre is greater, the more it is purified. The proportions of its principles are various; sometimes they are nearly equal; in other specimens the quantity of metal is larger.

The pure metal obtained from the ore, is of a silvery white colour, and plated texture, moderately hard, and very brittle; easily fusible, and even volatilized by a heat not very intense; oxidized by exposure to the air at a temperature moderately increased; and when oxidized, capable of combining with the greater number of the acids.

The antimonial metal is a medicine of the greatest power of any known substance; a quantity too minute to be sensible in the most delicate balance, is capable of producing violent effects, if taken dissolved, or in a soluble state.

Sulphureted antimony was employed by the ancients in collyria, against inflammations of the eyes; and for staining the eyebrows black. Its internal use does not seem to have been established till the end of the fifteenth century; and even at that time it was by many looked upon as poisonous. But experience has now fully evinced, that it has no noxious quality, being often used, particularly in chronick eruptions; that some of its preparations are medicines of great efficacy; and, that though many of them be most violently emetick and cathartick, yet even

these by a slight alteration or addition, lose their virulence, and become mild in their operation.

All the metallick preparations are uncertain, as it entirely depends on the state of the stomach, whether they have no action at all, or operate with dangerous violence. The sulphuret is exposed, though in a less degree, to the same objections.

The preparations of antimony do not exert any general stimulant operation, but are always directed in their action to particular parts, so as to occasion some sensible evacuation.

The principal general medicinal application of antimony has been for the cure of febrile affections. It is given so as to induce vomiting or purging, diaphoresis being also promoted; and, exhibited in this manner in the commencement of the disease, it has been considered capable of cutting short its progress.

In the latter stage of fever, where debility prevails, its use is inadmissible. Its efficacy has been in general ascribed to the evacuation it occasions: others have considered it, apparently with little reason, as exerting an action specifick or peculiar in itself, and not explicable on the known effects it produces.

Antimonials have been found to have the same good effects in intermittents as in continued fevers, as well as in several of the phlegmasiæ and exanthemata; and even in several of the profluvia. The general effects of antimonials are, in small doses, diaphoresis and nausea; in large doses, full vomiting and purging. Some allege that antimonials are of more use in fever when they do not produce any sensible evacuation; as is said to be the case sometimes with James's powder. They therefore prefer this in typhus; and emetick tartar in synochus; in which there is the appearance at first of more activity in the system, and more apparent cause for evacuation. As an emetick, antimony is distinguished, for the certainty, extent, and permanence of its operation. The action it excites in the stomach is both more forcible, and continues for a longer time, than that from other emeticks; and hence, it produces more complete evacuation, and occasions in a greater degree all those effects which result from the action of vomiting. Its action is also less local. It is very generally extended to the intestinal canal, so as to produce purging; and very frequently to the surface of the body, so as to occasion diaphoresis, or sweat.

The virtues of antimony in the diseases of animals, are greatly extolled. Pigs, that have the measles, are at all times recovered by it, which proves it to be a great purifier of the blood. Horses, which have the running heels, and cannot be cured by the common methods, will generally be cured by this medicine, in a little time. A horse that is lean and scabby, and not to be fatted by any other means, will become fat on taking one drachm of crude antimony every morning for two months together.

SUPER-TARTRIS POTASSÆ. *Super-Tartrite of Potass. Crystals of Tartar. Cream of Tartar.*

SUPER-TARTRIS POTASSÆ IMPURUS. *Impure Super-Tartrite of Potass. Tartar.*

Tartar is a concrete saline matter, which separates from wines, after they have undergone complete fermentation: it adheres to the top and sides of the cask, in red, or whitish gray crystals, according to the colour of the liquor. In this state, it is called *crude tartar;* having a subacrid taste, and being with difficulty soluble in water.

By repeated solution, filtration, and crystallization, crude tartar may be *depurated*, or divested of all gross and impure particles, when it is called *crystals of tartar;* and, if these be reduced to powder, *cream of tartar.*

This salt is a mild, cooling, aperient, and laxative medicine: if half, or a whole ounce of it be taken in substance, with treacle or any other vehicle, it proves an effectual purgative. Farther, when dissolved in water, it affords, with the addition of sugar, an agreeable acidulated drink, which is of great service in ardent fevers; and likewise forms a pleasant beverage during the summer. It is also to be regarded as a valuable diuretick, and, as one of those, most efficacious in the treatment of the dropsy. It is given under two modes of exhibition, in which its effects are somewhat different. When given dissolved in a large quantity of water, to the extent of four or six drachms in a day, it acts simply as a diuretick; when given to the same extent, gradually increased, in the form of an electuary, without the free use of diluents, along with a more or less diuretick effect, it acts as a hydragogue cathartick. The latter is the more usual, and perhaps, more successful mode of exhibition. Combined with jalap it forms one of the most efficacious catharticks

in dropsy, having a combined operation on the kidneys and alimentary canal, evacuating the water in the most effectual manner, and dispersing the dropsical swellings. In the hands of Dr. Ferrier, cream of tartar succeeded in thirty-three cases of dropsy out of forty-three.

SWIETENIA FEBRIFUGA. *Swietenia.* The bark.

The bark of the wood of this tree is of a red colour internally; externally it is covered with a gray epidermis; it has an astringent bitter taste; it yields its active matter to water, by infusion or decoction; and by evaporation an extract is obtained, highly astringent. It was introduced as a substitute for Peruvian bark, and in India where the tree is a native, has been used as such with advantage. It has been ascertained by Dr. Roxburgh that it contains a much larger proportion of active, bitter, and astringent power, and to be more antiseptick than Peruvian bark. Its dose in substance is half a drachm.

SWIETENIA MAHAGONI. *Mahogany.* The bark.

This species of the same genus as the preceding, has similar qualities and virtues, being equally bitter and astringent. It has therefore been received into the Edinburgh pharmacopœia, and may be employed to answer similar indications.

TAMARINDUS INDICA. *Tamarind Tree.* The preserved fruit, called tamarinds.

This tree grows both in the East and West Indies. The pod of the tree includes several large hard beans, with a brown viscid pulp, very acid. This pulp, mixed with the seeds and small fibres, and with a quantity of unrefined sugar, forms the tamarinds of the shops. Vauquelin found it to contain, beside the sugar mixed with it, citrick and malick acids, acidulous tartrite of potass, free tartarous acid, gelatin, mucilage, and fibrous matter.

The pulp of tamarinds, beside its virtues as an acid, proves laxative, when taken to the extent of an ounce and a half. It is generally added to other catharticks, which are given in the form of infusion, with the view of promoting their operation, and covering their taste. It increases the action of the purgative sweets, cassia, and manna, and weakens that of the resinous catharticks.

By its acidity this fruit quenches thirst, and allays immoderate heat.

Tanacetum Vulgare. *Common Tansy.* The leaves and seeds.

Tansy is an indigenous perennial, growing by road sides and the borders of fields, and is also cultivated in gardens. Its yellow blossoms appear in August. This plant possesses a warm bitter taste; it is deobstruent, not ungrateful to the palate, and some have had a favourable opinion of it in hysterick disorders. The leaves and seeds have been of considerable esteem as anthelminticks, and are given in doses of from one scruple to one drachm. The leaves are frequently used to give colour and flavour to pudding. And if fresh meat be rubbed with the plant, it will be effectually preserved from the attacks of the flesh fly.

Tela Araneii. *Cobweb.*

It has long been known that the spider and the spider's web have been ranked among the empirical remedies for the ague. But the fact is not so generally known that in 1644 this last substance was inserted in the dispensatory of Schroder as possessing febrifuge properties, and the power of curing intermittents. The web of the common house spider has recently attracted the attention of physicians, and its use is sanctioned by respectable medical authority. In the twenty-first and twenty-second volume of the Medical and Physical Journal, is recorded a communication from Dr. Robert Jackson, a distinguished English physician, announcing that the late Dr. Gillispie, of Edinburgh, a man of sound professional judgment, and of great candour and sincerity of character, having been baffled by the obstinacy of an intermittent fever, had recourse to the spider's web with the most perfect success. Dr. Jackson proceeds to recite the complete success which has attended his own experiments with the cobweb in the cure of intermittents. He next relates the very great relief procured by this substance in the advanced stage of phthisis pulmonalis, showing the extraordinary powers of cobweb in allaying irritation and procuring ease in a case past the reach of common remedies. The writer further observes, that he might multi-

ply instances of the efficacy of this substance if necessary, and the value of its tranquillizing effects, and recommends the trial of it in *hydrophobia*, as being a disease of excessive irritability. He adds, that he can attest by living evidence, that cobweb diminishes morbid irritability, and calms irritations both of body and mind, in a *degree far exceeding any drug or remedy* within the circle of our knowledge. The following remarkable case is adduced in the same publication to evince the singular efficacy of the spider's web. Walter Sands, Esq. has been afflicted for many years with a distressing asthma, which has proved fatal to his father and two sisters. The complaint being hereditary, and aggravated by malformation of the thorax, no remedy gave any permanent relief, nor did change of climate procure any alleviation of symptoms. He has often been under the direction of eminent physicians, and frequently in a kind of despair has resorted to numerous empirical compositions, but in vain. For a considerable time back he has never been able to lie down in bed on account of a sense of suffocation, but is obliged to be supported half sitting by pillows, and is seldom able to sleep. Having collected nearly a scruple of the spider's web he swallowed it at bed time, and to his utter astonishment enjoyed sound and uninterrupted sleep all night; a blessing to which he had been an entire stranger above six years. Since he began with the cobweb he thinks his health is improved; the cough has certainly abated, but whenever the remedy is omitted the complaint returns. In the spasmodick complaints of a woman which did not yield to the usual remedies, cobweb made up with crumb of bread into pills procured a lasting amendment.

B. Lynde Oliver, M. D. of Salem, made an experiment on himself by taking five grains of the cobweb at bed time, and found it to produce the most *delicious tranquillity* resembling the operation of opium, and followed by no bad effect. In full confidence in its remarkable sedative properties, he has since administered it in various diseases, and experienced the happiest results. It is not on all occasions, however, equally certain in its operation, sometimes disappointing expectation, and at others affording essential relief. Hence he conjectures that there is considerable difference in this substance as to virtue. By the use of this remedy his patient labouring under organick disease of the heart and hydrothorax ob-

tained great relief and refreshing sleep, who before had not slept for three nights. Another, under similar affection, experienced uncommon relief from the same prescription. To one suffering much pain from cancer it afforded ease and comfortable sleep. A patient in phthisis pulmonalis being affected with distressing agitation of mind and nervous irritation, it answered like a charm, and soon induced quiet sleep like a moderate dose of opium.

Professor Chapman, of Philadelphia, in his elements of therapeuticks and materia medica, says of the tela aranei, "In doses of five grains, repeated every fourth or fifth hour, I have cured some very obstinate intermittents, suspended the paroxysms of hectick, overcome morbid vigilance from excessive nervous irritability, and quieted irritations of the system from various causes." Dr. John Webster, of Boston, in his clinical remarks, (New England Journal, new series, vol. 4. p. 218,) observes incidentally, that the web of the black spider which is found in cellars, stables, and similar places which he was induced to exhibit in consequence of the high commendation bestowed on it by Dr. R. Jackson, has in many cases produced excellent effects. "In many painful affections, in the restlessness of fevers, the symptoms of irritation which are so frequently occurring in patients under a mercurial course for syphilis, and other diseases, in rheumatick headache, asthma, and chronick coughs, I have prescribed the cobweb with the most decided good effect. Twenty grains have been given daily for some time past to a female epileptick patient, where the medicines usually recommended, had been tried with no benefit; the only substance which has mitigated the violence of the disease, and prolonged the intervals of attack has been the cobweb. The cobweb is readily made into pills with a small quantity of mucilage, and the best mode of exhibiting it, I have found to be in five grain doses every half hour; but have not observed any more relief obtained by forty grains than from twenty; the only increased effect appears to be upon the intestinal canal. In one case (an old and infirm asthmatick) slight but pleasant delirium was produced, and from the report of the persons who slept in the room with him, the effect though of longer duration was very similar to that of a dose of nitrous oxide gas, the muscular energy having been exceedingly increased, the patient could not be

confined to bed, but danced and jumped about the room, nearly all night; in the morning I found him quietly asleep; no unpleasant symptoms ensued. To irritable sores the cobweb has proved a highly beneficial application." I have recently been informed that at Savannah sixteen persons labouring under ague and fever in a severe form, were each of them cured by the cobweb in twenty-four hours.

TOLUIFERA BALSAMUM. *Balsam of Tolu Tree.* The balsam, called balsam of tolu.

This tree grows in Spanish America, and the balsam flows from incisions made in its bark, during the hot season; and is brought to us in gourd shells. It is of a yellowish brown colour, inclining to red: in consistence, thick and tenacious: by age it grows hard and brittle, without suffering any great loss from its more valuable parts. The smell of this balsam is extremely fragrant, somewhat resembling that of lemons; its taste warm and sweetish.

Lewis says that he has sometimes procured benzoic acid from it; it yields very little volatile oil, although it impregnates the distilled water strongly with its flavour. By dissolving a proper quantity of sugar in this water, a syrup is obtained, greatly superiour to that prepared in the common way, with a decoction of the balsam.

This is the mildest of all the balsams. It has been esteemed as an expectorant, but its powers are very inconsiderable, and it is employed principally on account of its flavour. It possesses, however, all the virtues of the other balsams, and is more fragrant than most of them.

TORMENTILLA ERECTA. *Septfoil.* The root.

Tormentil is perennial, and found wild in woods and on commons; it has long slender stalks, with usually seven long narrow leaves at a joint; the root is for the most part crooked and knotty, of a blackish colour on the outside, and a reddish within. This root has an austere, styptick taste, accompanied with a slight kind of aromatick flavour; it is one of the most agreeable and efficacious of the vegetable astringents, and is employed with good effect in all cases where medicines of this kind

are proper. It has been used in diarrhœa, under the form of decoction, and in intermittent fever, in substance, in a dose from half a drachm to a drachm.

TRIOSTEUM PERFOLIATUM. *Fever Root.* The root.

In professor Bigelow's medical botany will be found the following information respecting this new article of our materia medica. "This is rather a solitary plant, and though met with in most parts of the United States, it rarely, I believe, occurs in large quantities. About Boston it is found in several places at the borders of woods in rich, shady situations. Its common names are *fever root*, and *wild ipecac.* Pursh observes, that it is rare, and generally occurs in limestone soils. With us it flowers in June, and ripens its fruit in September.

"The root of this plant is perennial, and subdivided into numerous horizontal branches. The stem is erect, hairy, fistulous, round, from one to four feet high. The leaves are opposite, the pairs crossing each other, connate, ovate, occuminate, entire, rather flat, abruptly contracted at base into a sort of neck, resembling a winged petiole. The flowers are axillary, sessile, five or six in a whorl, the upper ones generally in a single pair, and of a dull brownish purple covered with minute hairs. The fruit is an oval berry of a deep orange yellow, hairy, somewhat three sided, crowned with calyx, containing three cells and three hard, bony, furrowed seeds, from which the name of the genus is taken. This plant was made the subject of an interesting communication to the Linnæan society of New England, by Dr. John Randall. The experiments made by him on its medical uses and pharmaceutical preparations were numerous, and serve to throw much light on its properties. The sensible qualities of the root were found essentially different from those of the herb. Both of them possess a large share of bitterness, but the root has also a nauseous taste and smell, somewhat approaching to those of ipecacuanha. The medical properties of the triosteum are those of an emetick and cathartick. In the above dissertation, about thirty cases are detailed, in which different preparations and quantities of the article were given to various persons with a view to their medicinal effects. The general inference to be made from them is, that the bark of the root acts with tolerable certainty as an evacuant upon

the alimentary canal, both by emesis and catharsis. When given alone, either in powder or decoction, the instances of its failure were not many, and when combined with calomel, its operation was attended with a certainty hardly inferiour to that of jalap. The late professor Barton, of Philadelphia, in his collections speaks of this plant as a mild and good cathartick, sometimes operating as a diuretick, and in large doses as an emetick.

My own experience with this plant, says Dr. Bigelow, has not been extensive, yet sufficient to satisfy me of its medicinal power. Where I have administered it, it has generally proved cathartick, a larger dose however being requisite for this purpose, than of jalap or aloes. It has sometimes failed to produce any effect, and I am inclined to believe that its efficacy is much impaired by age. Those who may incline to employ it, will do well to renew their stock annually, and to keep the powder in close stopped phials. A dose of the bark of the root in powder is twenty or twenty-five grains, and of the extract, a somewhat smaller quantity.

TRITICUM ÆSTIVUM. *Wheat.* The flour and starch prepared from the seeds.

Wheat flour consists principally of gluten, starch, albumen, and a sweet mucilage. It is the presence of gluten that characterises wheat flour; and on the due admixture of it with the other constituents, depends the superiority of wheat flour for baking bread. Bread is not only one of the most important articles of nourishment, but is also employed in pharmacy for making cataplasms, and giving form to more active articles. An infusion of toasted bread has a deep colour and pleasant restringent taste; and is an excellent drink in febrile diseases, and in nausea and debility of the stomach; and also in *cholera morbus:* examples are related of several cases of this kind cured by it, without the aid of any other medicine.

Starch, the fecula of wheat, forms a gelatinous solution when boiled with water, which is used as a demulcent. It is thus given as an enema in dysentery and diarrhœa, from irritation of the intestines, and is the common vehicle for giving opium in that form.

Tussilago Farfara. *Coltsfoot.* The leaves and flowers.

This grows wild in moist situations, producing yellow flowers in February and March: These soon fall off, and are succeeded by large, roundish leaves, hairy underneath; their taste is herbaceous, somewhat glutinous and subacrid. It is recommended in coughs, phthisis, and other disorders of the breast and lungs, and some use it in scrofula. It is chiefly directed to be taken with milk, and upon this, probably, more than on the tussilago itself, any benefit derived from it in practice is to be explained.

Ulmus Aspera. *Slippery Elm.* The inner bark.

We have two species of ulmus or elm in the United States. The red or *slippery* elm, or American rough leaved elm of Marshal, (ulmus rubra of Mulenburgh) on account of its many valuable properties, deserves particular mention. It rises to the height of thirty feet, with a pretty strong trunk, dividing into many branches, and covered with a light coloured rough bark. The leaves are oblong, oval, and sharp pointed, unequally sawed on their edges, unequal at the base, very rough on their upper surface, and hairy underneath. The flowers are produced thick upon the branches, upon short, collected foot stalks, and are succeeded by oval, compressed membraneous seed vessels, with entire margins, containing one oval compressed seed. The inner bark, by infusion or gentle boiling in water, affords a great quantity of insipid mucous substance, that is applicable to a variety of important uses. Dr. Mitchell says it has been beneficially administerd in catarrhs, pleurisies, and quinsies; it has been applied as a poultice to tumours, and as a liniment to chops and festers. [Letter to Dr. North, Amer. Museum, vol. 7th.]

The surgeons of our revolutionary army, and also those of general Wayne's army, who defeated the Indians in August, 1794, experienced the most happy effects from the application of poultices of the elm bark to gunshot wounds, which were soon brought to a good suppuration, and to a disposition to heal. It was applied as the first remedy. When tendency to mortification was evident, this bark bruised, and boiled in water, produced the most

surprising good effects. After repeated comparative experiments with other emollient applications, as milk and bread, and linseed poultice, its superiority was firmly established. In old ill conditioned ulcers, and in fresh burns, equal benefit was derived from it. The infusion of the bark was used with advantage as a diet drink, in pleurisy, and catarrh, and also in diarrhœa and dysentery. Many of the above facts relative to the medicinal qualities of the red elm, were communicated, says the editor of the Domestick Encyclopœdia, by Dr. Joseph Strong, of Philadelphia, who served as surgeon in the western army; and adds, as a proof of the nutriment which it affords, that a soldier who lost his way supported himself for ten days upon this mucilage and sassafras. The editor of the abovementioned work, (vol. 2d, p. 448,) proceeds to observe, that the red elm tree may be considered as a highly valuable addition to our stock of medicines, exclusively American, and ought to be carefully searched for by the medical gentlemen in the country, and preserved from the indiscriminate axe.

The inner bark of the slippery elm, or its mucilage, has been found by recent experience to be singularly beneficial when applied to chilblains, cutaneous eruptions, and various kinds of sores and ulcers; and there is much reason to believe, that its internal use in dysentery, consumption, &c. may be attended with greater advantage than is generally imagined. This tree certainly may be recommended to the particular regard of medical practitioners as a new, and domestick article of our materia medica, whose medicinal virtues will probably be found to merit a large share of confidence.

URTICA DIOICA. *Common Nettle.* The plant.

This is a well known perennial weed. The leaves of the fresh plant stimulate, inflame, and raise blisters on the part of the skin which they touch. Hence, when a powerful rubefacient is required, stinging with nettles has been recommended. It has been said, sometimes to have succeeded in restoring sense and motion to paralytick limbs. M. Zannetini, in Italy, asserts, that the flowers and seeds of the common nettle, may, with efficacy be substituted for the Peruvian bark, in all febrile affections, especially in tertian and quartern agues. It operates more speedily than the bark; and in large doses, induces a lethargick

sleep; the portion to be given should never exceed one drachm, and should be administered in wine, two or three times in twenty-four hours. The same cautions that are necessary in the use of Peruvian bark, are likewise to be observed in taking the seeds and flowers of the nettle.

VALERIANA OFFICINALIS. *Wild Valerian.* The root.

This plant is perennial, and grows wild in England. The root, which is the part used in medicine, consists of a number of slender fibres matted together, and attached to one head, of a brown colour, having a strong and unpleasant smell, and a warm bitter taste. Its active matter is extracted equally by water and by alcohol. Its infusion changes colour, on the addition of sulphate of iron. By distillation, water is impregnated with its flavour, but not with its taste. No essential oil is obtained.

Valerian is one of the principal modern antispasmodicks, and is used with advantage in chorea, epilepsy, and hemicrania. Some recommend it as useful in procuring sleep, particularly in fever, even when opium fails; but it is principally useful in nervous and hysterical affections. The common dose is from a scruple to a drachm in powder; and in infusion, from one, to two drachms, three or four times in the day, which is increased gradually, as far as the stomach can bear it. Its unpleasant flavour is most effectually covered by a suitable addition of mace. Valerian is lately found in abundance on the borders of the Ohio river, not inferiour to that imported from Europe.

VERATRUM VIRIDE. *Poke Root. Swamp Hellebore.* The root.

This perennial plant grows in wet meadows and swampy places, often locally associated with skunk cabbage, which, early in the spring season it considerably resembles in appearance; the latter plant, however, has no stalk, while the hellebore sends forth one which attains to the height of two or three feet, terminating in June in a spike of flowers and seeds. The leaves are large and handsomely plaited. The root is bulbous, and when fresh has a nauseous, bitterish, acrid taste, burning the mouth and fauces. Snuffed up the nostrils in very small quantities, it excites violent sneezing, with a sense of heat,

and a copious discharge of mucus. The fresh root, in form of ointment or decoction, cures the itch. Crows are destroyed by boiling Indian corn in a strong decoction of the roots, and strewing it on the ground where these birds resort. The root when dried has no particular smell, but a durable nauseous and bitter taste, and when powdered and applied to issues or ulcers, is said to produce griping and purging. The European species of veratrum album was on some occasions employed by the ancients as an emetick or cathartick; but it was found to operate with such violence as to occasion dangerous affections; and in present practice it is seldom used, but as a powerful errhine or sternutatory. The American species has a close affinity to the European, in its character and properties. Experiments made with this root to ascertain its emetick and cathartick powers have not resulted very favourably. In doses of four, six, or eight grains, it was not uniform in its operation; while in some instances, moderate vomiting was induced, in others its action was extremely violent; and in a few, no effect whatever was produced, or vomiting ensued several hours after its having been taken. Such are its acrimonious qualities, that it must never be employed without caution; even when combined with opium, in the form of the reputed Eau Medicinale, in one instance severe vomiting was induced, and a dangerous *gastritis* of several days continuance ensued. This root is an ingredient in the celebrated Coit's pills; and it is supposed to add much to their efficacy as an active cathartick. It is undoubtedly a plant of highly active powers, meriting a particular investigation as an article of our materia medica. In fact, a new interest has lately been excited both in Europe and the United States, relative to the properties of white hellebore. It is even supposed to be the basis of the French specifick remedy, called *Eau Medicinale d'Husson*, so highly famed for its almost infallible powers in the cure of gout, as to command the enormous price of from one to two crowns a dose. This remedy was discovered about forty years ago, by M. Husson, a French officer, who affirms it to be prepared from a plant whose virtues were before unknown in medicine; and it has long been celebrated in France and other parts of the European continent.

Dr. Edwin G. Jones, member of the royal college of physicians, London, after a thorough investigation of the

subject, has, in a late publication, adduced the most unequivocal evidence of the superiour powers of the *Eau Medicinale*, in curing the most distressing paroxysms of gout. His experience of its efficacy has been extensive, and among the numerous and remarkable instances to which he refers, are persons of distinguished rank and respectability, and whose cases were marked with symptoms of extreme severity. We have therefore the authority of Dr. Jones to assert, that this singular remedy exerts an extraordinary influence over the gout; and that it will safely, and almost immediately remove, often by a single dose, the severest paroxysms of that cruel disease, is sufficiently ascertained by a multitude of facts, collected from various sources of unquestionable authenticity.—Scarcely an instance of its failure has yet been known to occur in practice. It is not, however, asserted, that it performs a radical cure of gout, eliminating the disease altogether from the system, but its operation is different from that of any remedy hitherto employed; it removes the paroxysms as often and almost as soon as they occur. It in fact relieves the patient from agonizing pain, from all the miseries of long confinement, and restores him to his usual state of health, and the exercise of his limbs. It appears to be a powerful sedative, diminishing almost immediately the irritability of the system. Hence it allays pain, procures rest and sleep, reduces the pulse and abates fever.

This remedy has been extended to other diseases, and in several cases it has removed very severe acute rheumatisms in the same singular manner it does the gout.

The full dose of this medicine, according to Husson, and Dr. Jones, is about two drachms for an adult, mixed with an equal quantity of water, and taken on an empty stomach. Its operation may be promoted by some aromatick, or by peppermint, pennyroyal, or ginger tea. It in general occasions some nausea and vomiting, followed by bilious stools. A single dose will often carry off an attack, but it sometimes requires to be repeated in under doses. Some instances are recorded of its violent effects when exhibited in a dose disproportionate to the constitution, and particular circumstances. On some occasions much advantage has been derived from small doses taken every day for a considerable time.

The discovery of the substance from which this remedy is prepared would be an invaluable acquisition to our

materia medica. The importance and popularity of the subject were incitements to various attempts for that purpose, and to the ingeunity of Mr. J. Moor, member of the royal college of surgeons, London, the publick are indebted for a composition, which if not identically the same, bears a strong resemblance to the *Eau Medicinale* in smell, taste, and dose; and also in all its effects, so far as it has been tried in the cure of gout. The composition of Mr. Moor consists of wine of opium sydenham, one part, wine of white hellebore, three parts, made by infusing, for ten days, eight ounces of the sliced root of that plant, in two and half pints of white wine, and strained through paper. This compound, when exhibited in doses of from one to two drachms, has in a variety of instances effected a speedy cure of gouty paroxysms. There are indeed well attested examples where the most painful gouty affection has yielded to a single dose of about one drachm, and the instances of its failure have hitherto, it is believed, been more rare than can be said of any other remedy. The employment of the composition of Mr. Moor, has also, in the hands of respectable physicians, been extended to acute rheumatism, and to some comatose affections, with the most decided advantage, and a perseverance in similar trials is strongly recommended. It has been observed, that beneficial effects may more certainly be expected when it excites some degree of nausea and vomiting, which an overdose like *Eau Medicinale* seldom fails to induce.

We have hitherto been furnished with the additional evidence of every day's experience of the efficacy of Mr. Moor's composition in the cure of both gout and rheumatism, and no circumstance, it is believed, has yet occurred, tending to impair our faith in the analogy of its principles with the original preparation of M. Husson.

The American green hellebore has frequently been employed as a substitute for the European species or white hellebore; and in all the instances the effect has been so precisely similar, that neither physician or patient could perceive any difference in the mode of its operation. The medicine prepared from this plant afforded relief in some instances in the small dose of fifteen or twenty drops, in others a drachm was administered; and in general the paroxysms of gout, and severe rheumatick affections yielded to its efficacy. Some individuals however experienced such distressing effects as

to deter from a second trial, "such as excessive sickness, purging, great prostration of strength, impaired vision, and even total insensibility, where the dose has been imprudently large." An ointment and a strong decoction of this plant have been used as an external application with some success in tinea capitis, itch, and other cutaneous affections; and even in this form Dr. Bigelow has found it to produce the same effect on the stomach as the internal use of the medicine.

VIOLA ODORATA. *March Violet.* The recent flower.

This plant is perennial, and found wild under hedges, and in shady places; but shops are generally supplied from gardens. Its flowers are so remarkable for their delightful odour, and their peculiar richness of colour, that they have given a name to both.

They impart their colour and flavour to aqueous liquors: a syrup made by this infusion has long maintained a place in the shops, and is said to be an agreeable and useful laxative for children; but is chiefly valued as a delicate test of the presence of uncombined acids or alkalis, the former changing its blue to a red, and the latter to a green colour.

VITIS VINIFERA. *The Vine.* The dried fruit, called raisin, and the fermented juice of the fruit, called Spanish white wine.

The vine grows in temperate situations in many parts of the world, and is cultivated very generally for the sake of its agreeable subacid fruit. Before they are ripe, grapes are extremely harsh and acid, and by expression furnish a liquor which is called verjuice. It contains malick acid, super-tartrite of potass, and extractive, and may be made to furnish wine by the addition of sugar. As the grape advances to maturity, the quantity of sugar increases, while that of malick acid diminishes; it, however, never disappears entirely. When thoroughly ripe, the grape is one of the most agreeable fruits. It is cooling, antiseptick, and nutritious; and, when eaten in considerable quantity, diuretick, and gently laxative. In inflammatory diseases, and all others where acids are indicated, they form an excellent article of diet.

Raisins, *uvæ passæ*, are grapes which have been carefully dried. By this means, not only the water they contain is dissipated, but the quantity of acid seems to be diminished. They become more saccharine, mucilaginous, and laxative, than the recent grape, but are less cooling.

Wine is the juice of the grape, altered by fermentation. The numerous varieties of wine depend principally on the proportion of sugar contained in the must, and the manner of its fermentation. When the proportion of sugar is sufficient, and the fermentation complete, the wine is perfect and generous: if the quantity of sugar be too large, part of it remains undecomposed, as the fermentation is languid, and the wine is sweet and luscious; if, on the contrary, it be too small, the wine is thin and weak, and if it be bottled before the fermentation be completed, it will proceed slowly in the bottle, and, on drawing the cork, the wine will froth and sparkle in the glass, as for example, Champaigne. When the must is separated from the husk of the grape before it is fermented, the wine has little or no colour: these are called white wines. If, on the contrary, the husks are allowed to remain in the must while the fermentation is going on, the alcohol dissolves the colouring matter of the husks, and the wine is coloured: such are called red wines. Besides in these principal circumstances, wines vary very much in flavour. The red wines, are Port, which is strong and austere, and Claret, which is thinner and higher flavoured. Our white wines are called Madeira, Sherry, Lisbon, Malaga, and Hock. Of these the last is most acidulous, and Malaga the sweetest.

Wine, taken in moderate quantities, acts as a beneficial stimulus to the whole system. It promotes digestion, increases the action of the heart and arteries, raises the heat of the body, and exhilarates the spirits. Taken to excess, it produces inebriety and stupor, which are often succeeded by headache, nausea, and diarrhœa, which last for several days. Habitual excess in wine debilitates the stomach, produces inflammation of the liver, weakens the nervous system, and gives rise to dropsy, gout, apoplexy, tremours, and cutaneous affections.

To convalescents, and in all diseases of general debility, and deficiency of the vital powers, wine is the remedy on which we must place our chief dependence; and when

properly administered, its effects are often scarcely credible.

In typhus fever, attended by low delirium arising from debility, wine administered to the extent of one bottle or more in twenty-four hours, surprisingly mitigates the symptoms, and finally proves a sovereign remedy.

Its administration is regulated by the effects it produces; advantage being always derived from it when it renders the pulse more slow and firm; when the recurrence of delirium is prevented; when irritation is lessened, and sleep induced. If the pulse is quickened, and the countenance becomes flushed, if it excite thirst, increase the heat of the body, and occasion restlessness or delirium, it is obviously injurious, and its use should be suspended.

The wines prepared from other fruit than the grape, are less spiritous and more acescent, and are hence inferiour in tonick power. Fermented liquors, especially porter, are sometimes substituted for wine, where this is necessary from idiosyncracy, and their powers are somewhat modified by their other qualities, particularly by their bitterness, and by the pungency arising from their excess of carbonick acid. Their narcotick power is often greater than is proportioned to their vinous strength, owing to the addition of narcotick substances which they often receive in the preparation.

In the hands of Dr. Rush, and other eminent physicians in the United States, wine, aided by the use of bark, has frequently succeeded as a radical remedy in tetanus. Dr. Hosack, of New York, effected a cure in a case of lock-jaw, by administering wine alone to the extent of three gallons in four days. Dr. James Currie, of Liverpool, England, has also experienced the efficiency of wine in the same disease. He asserts that a horse affected with lock-jaw, having been made the subject of experiment, was completely cured by the liberal use of wine alone.

Wine has been emphatically termed "the milk of the aged," but parents are seriously advised to beware of giving wine to their children *indiscriminately;* because to them it can be of service only when taken as a medicine; and those injudicious persons, who encourage young people to take wine *habitually* at their meals, are guilty of an abuse, which cannot be easily repaired by future abstinence.

Wine is often adulterated with lead or other deleterious drugs. In order to detect this fraud, take two drachms of cream tartar, and one drachm of liver of sulphur; put them into a two ounce phial of soft water. The phial must be kept well corked, and occasionally shaken for about ten minutes: when the powder has subsided, decant the clear liquor, and preserve it in a well stopped bottle. From sixteen to twenty drops of this liquid are to be dropped in a small glass filled with the suspected wine; and if the wine turns blackish or muddy, and deposits a dark coloured sediment, we may be certain it is impregnated with sugar of lead, or some other preparation of that metal equally destructive.

A receipt to make an excellent American Wine, by Joseph Cooper, Esq. of Gloucester county, New Jersey.

"I put a quantity of the comb from which the honey had been drained, into a tub, and added a barrel of cider, immediately from the press; this mixture was well stirred and left for one night. It was then strained before a fermentation took place; and honey was added until the strength of the liquor was sufficient to bear an egg. It was then put into a barrel; and after the fermentation commenced, the cask was filled every day, for three or four days, that the filth might work out at the bunghole. When the fermentation moderated, I put the bung in loosely, lest stopping it tight might cause the cask to burst. At the end of five or six weeks, the liquor was drawn off into a tub; and the whites of eight eggs, well beat up, with a pint of clean sand, were put into it: I then added a gallon of cider spirit; and after mixing the whole well together, I returned it into the cask, which was well cleansed, bunged it tight, and placed it in a proper situation for racking off, when fine. In the month of April following, I drew it off into kegs, for use; and found it equal, in my opinion, to almost any foreign wine: in the opinion of many judges, it was superiour.

"This success has induced me to repeat the experiment for three years; and I am persuaded, that by using clean honey instead of the comb, as above described, such an improvement might be made, as would enable the citizens of the United States to supply themselves with a truly federal and wholesome wine, which would not cost a quarter of a dollar per gallon, were all the ingredients

procured at the market price; and would have this peculiar advantage over every other wine, hitherto attempted in this country, that it contains no foreign mixture, but is made from ingredients, produced on our own farms."

XANTHORHIZA APIIFOLIA. *Shrub Yellow Root.* The stem and root.

Is a native plant of North Carolina, first brought by the late John Bartram, from that state, and planted in his garden at Kingsess, in the county of Philadelphia, where it has continued to flourish in a most luxuriant manner. It is denominated *simplicissima* by Marshal, *apiifolia* by L'Herretier, and *marbosia*, by Mr. William Bartram, in honour of Mr. De Marbois. Xanthorhiza tinctoria is a more expressive name than any it has yet received.

Dr. Woodhouse has given an excellent account of this valuable plant, in the fifth volume of the Medical Repository of New York, from which the present extract is taken.

"The stems are three feet high, and somewhat thicker than a goose quill. The root is from three to twelve inches long, and about the diameter of a man's little finger, sending off numerous scions. The leaves are placed alternately, having long petioles and pinnated, terminating in an old one; the follicles sessile, and lacerated deeply on their edges. The *peduncles* are branchy, and placed immediately beneath the first leaves, from which cause the flowers appear before the leaves, very early in the spring."

The stem and root are of a bright *yellow* colour, and possess a strong bitter taste.

The *xanthorhiza tinctoria* contains a gum and resin, both of which are intensely bitter; the resin is more abundant than the gum.

It imparts a drab colour to cloth, and a handsome yellow to silk; but the dye will not take on cotton or linen.

The watery extract of the grated roots mixed with alum, and added to Prussian blue, was first used by Mr. James Bartram for colouring plants, and the plumage of birds of a green colour. The green is far more lively and elegant than that made with gamboge and Prussian blue, which is generally used for painting in water colours, and stands well in the shade, but soon contracts a dull colour when exposed to a bright light, and to a high temperature.

Various subjects coloured by this green, and enclosed in a book, were as lively after one year, as when first painted.

It is a strong and pleasant bitter, and preferable to all our native bitters. It sits easy on the stomach in the dose of two scruples.

The colour of the leaves appears to reside in a resin which is altered by the combined action of light and oxygen, by either of which, separately, it cannot be affected.

As the xanthorhiza is a strong and pleasant bitter, and very nearly allied to the columbo root, it promises to become a valuable addition to the American materia medica. Dr. Woodhouse has often used the powdered stem and root of the xanthorhiza with success, in the dose of two scruples to an adult, in many of those diseases in which bitters are recommended, but generally combined with other remedies. It is a medicine which sits easy on the stomach, and produces no disagreeable effects.

XANTHOXYLUM CLAVA HERCULIS. *Prickly Yellow Wood. Yellow Hercules.* The wood and root.

Is a native of Jamaica, and other tropical countries, where it grows to the height of sixteen feet, and is about twelve inches in diameter. This straight tree somewhat resembles the common ash: the bark of the trunk is covered with numerous prickles; and the wood is of a bright yellow cast.

The wood of the xanthoxylum is chiefly employed for the heading of hogsheads, for bedsteads, and numerous other purposes: it also possesses remarkable medicinal virtues. The fresh juice expressed from the roots, affords certain relief in the painful disease, termed *dry bellyache*. This important fact was discovered in the West Indies, by watching a female slave, who collected the root in the woods, and gave two spoonfuls of its juice to a negro, suffering under that colick, at an interval of two hours. Such medicine occasioned a profound, but composed sleep of twelve hours; when all sense of pain, and other distressing symptoms, had vanished: the cure was completed, by giving an infusion of such expressed roots in water, by way of diet drink. Farther, the juice of the prickly yellow wood, when preserved in rum, and administered in doses not exceeding a wine-glassful, has effectually removed the most obstinate epileptick fits; but Dr. Henry

has not mentioned the *manner* in which this preparation ought to be managed.

To the above observations of Dr. Willick, the following by Dr. Mease are added: (*Dom. Ency.*)

Two species grow in the United States.

Xanthoxylum fraxinifolium, or ash-leaved xanthoxylum, growing in Pennsylvania, and Maryland: and xanthoxylum calvis herculis, or prickly yellow wood, which grows in the more southern states.

The bark and capsules are of a hot acrid taste, and when a small quantity is chewed, powerfully promotes the flow of saliva. It is used in this way to relieve the tooth-ache. A tincture of the same parts of the tree is a common country remedy for the chronick rheumatism.

In the West Indies a decoction of the bark is used with great success as an internal remedy, and also as a wash for foul ulcers, which it powerfully cleanses, and disposes to healthy granulations. The powdered bark is also mixed with the dressings. In the *London Medical and Physical Journal*, volume second, and following, there are several cases related of the efficacy of this medicine in the above disease.

Zincum. *Zinc.*

This is a semimetal, naturally obtained in a state of combination with different minerals, in England, Hungary, and other parts of the globe: it is of a whitish colour, nearly resembling that of lead, though it does not speedily tarnish.

Zinc exerts no sensible action on the system in its metallick state; it is employed, therefore, under various forms of preparation, where the medicinal virtues of the article will be described.

COLLECTION AND PRESERVATION

OF

SIMPLES.

Each of the kingdoms of nature furnishes articles which are employed in medicine, either in their natural state, or after they have been prepared by the art of pharmacy.

In collecting these, attention must be paid to select such as are most sound and perfect, to separate from them whatever is injured or decayed, and to free them from all foreign matters adhering to them.

Those precautions must be taken which are best fitted for preserving them. They must in general be defended from the effects of moisture, too great heat, or cold, and confined air.

When their activity depends on volatile principles, they must be preserved from the contact of the air as much as possible.

As the vegetable kingdom presents us with the greatest number of simples, and the substances belonging to it are the least constant in their properties, and most subject to decay, it becomes necessary to give a few general rules for their collection and preservation.

Vegetable matters should be collected in the countries where they are indigenous; and those which grow wild, in dry soils, and high situations, fully exposed to the air and sun, are in general to be preferred to those which grow in moist, low, shady, or confined places.

Roots which are annual, should be collected before they shoot out their stalks or flowers; biennial roots in the harvest of the first, or spring of the second year; perennial, either in the spring before the sap has begun to mount, or in harvest, after it has returned.

Those which are worm eaten, or decayed, are to be rejected. The others are immediately to be cleansed with a brush and cold water, letting them lie in it as short time as possible; and the fibres and little roots, when not essential, are to be cut away.

Roots which consist principally of fibres, and have but a small tap, may be immediately dried. If they be juicy, and not aromatick, this may be done by heat, not exceed-

ing 100° of Fahrenheit; but if aromatick, by simply exposing them, and frequently turning them in a current of cold, dry air: If very thick and strong, they are to be split or cut into slices, and strung upon threads; if covered with a tough bark, they may be peeled fresh, and then dried. Such as lose their virtues by drying, or are directed to be preserved in a fresh state, are to be kept buried in dry sand.

No very general rule can be given for the collection of herbs and leaves, some of them acquiring activity from age, and others, as the mucilaginous leaves, from the same cause, losing the property for which they are officinal. Aromaticks are to be collected after the flower buds are formed; annuals, not aromatick, when they are about to flower, or when in flower; biennials, before they shoot; and perennials, before they flower, especially if their fibres become woody.

They are to be gathered in dry weather, after the dew is off them, or in the evening before it falls, and are to be freed from decayed, withered, or foreign leaves. They are usually tied in bundles, and hung up in a shady, warm, and airy place; or spread upon the floor, and frequently turned. If very juicy, they are laid upon a sieve, and dried by a gentle degree of artificial warmth.

Sprouts are collected before the buds open; and stalks are gathered in autumn.

Barks and woods are collected when the most active part of the vegetables are concentrated in them, which happens in spring and in autumn. Spring is preferred for resinous barks; and autumn for the others, which are not resinous, but rather gummy. Barks should be taken from young trees, and freed from decayed parts, and all impurities.

The same rules direct the collection of woods; but they must be taken from very young trees. Among the resinous woods, the heaviest, which sink in water, are selected. The alburnum is to be rejected.

Flowers are collected in clear, dry weather, before noon, but after the dew is off; either when they are about to open, or immediately after they have opened. Of some the petals only are preserved, and the colourless claws are even cut away; of others, whose calyx is odorous, the whole flower is kept. Flowers which are too small to be pulled singly, are dried with part of the stalk: these are called heads, or tops.

Flowers are to be dried nearly as leaves, but more quickly, and with more attention. As they must not be exposed to the sun, it is best done by a slight degree of artificial warmth.

Seeds and fruits, unless when otherwise directed, are to be gathered when ripe, but before they fall spontaneously. Some pulpy fruits are freed from their core and seeds, strung upon threads, and dried artificially. They are in general best preserved in their natural coverings, although some, as the colocynth, are peeled; and others, as the tamarind, preserved fresh. Many of these are apt to spoil, or become rancid; and as they are then not fit for medical use, no very large quantity of them should be collected at a time.

The proper drying of vegetable substances is of the greatest importance. It is often directed to be done in the shade and slowly, that the volatile and active particles may not be dissipated by too great heat; but this is an errour, for they always lose infinitely more by a slow, than by a quick drying. When, on account of the colour, they cannot be exposed to the sun, and the warmth of the atmosphere is insufficient, they should be dried by an artificial warmth, less than 100° Fahrenheit, and well exposed to a current of air. When perfectly dry and friable, they have little smell; but after keeping for some time, they attract moisture from the air, and regain their proper odour.

The boxes and drawers in which vegetable matters are kept, should not impart to them any smell or taste; and more certainly to avoid this, they should be lined with paper. Such as are volatile, or of delicate texture, or subject to suffer from insects, must be kept in well covered glasses. Fruits and oily seeds, which are apt to become rancid, must be kept in a cool and dry, but by no means a warm or moist air.

Oily seeds, odorous plants, and those containing volatile principles, must be collected fresh every year. Others, whose properties are more permanent, and not subject to decay, will keep for several years.

Vegetables collected in a moist and rainy season, are in general more watery, and apt to spoil. In a dry season, on the contrary, they contain more oily and resinous particles, and keep much better. They ought to be collected annually, and if they have been kept for a longer period, should be rejected.

PART III.

PREPARATIONS AND COMPOSITIONS.

The practice of pharmacy is regulated by the different pharmacopœias, and these vary in no inconsiderable degree in the mode of conducting the process, and even with respect to the proportion of the active ingredients which constitute some of the compositions, as directed by the respective colleges. Having taken the Massachusetts pharmacopœia, as the basis of this part of the work, which accords also with that of the Edinburgh college, it seems inexpedient to introduce the analogous preparations of the London and Dublin pharmacopœias. I have not, however, neglected altogether to notice in course, such essential differences as appear calculated to lead to practical errour and embarrassment. I have also selected from Dr. Powel's late translation of the London pharmacopœia, a few officinal preparations on account of their obvious utility.

A system of pharmacy is thus presented amply adequate to all the purposes of American physicians, divested of that tedious repetition which is unavoidable when the processes of all the pharmacopœias are regularly introduced.

CHAPTER I.

SULPHUR.

Sulphur Sublimatum Lotum. *Washed Sublimed Sulphur.* *Washed Flowers of Sulphur.

Take of Sublimed sulphur, one pound,
Water, four pounds.

* The translation of the ancient names are added in Roman letters. Tables are annexed containing the ancient names, with their synonymies, and the systematick names with their synonymies.

Boil the sulphur for a little while in the water, then pour off this water, and wash away all the acid by affusions of cold water; lastly, dry the sulphur.

A small portion of sulphur in its sublimation sometimes suffers oxidation from the air of the chamber into which it is sublimed, and hence acquires a slight acidity, which the present process is designed to remove. This is so rarely the case, however, that it is one perhaps unnecessary.

CHAPTER II.

ACIDS, ALKALIS, EARTHS, AND THEIR COMPOUNDS.

The term salt has long been employed in chemical language to denote an extensive order of substances; yet it is difficult to assign to it a precise definition, or to distinguish these by characters at once sufficiently comprehensive and appropriate.

Those properties which have been assigned as the characters of the order are not possessed by every substance which in chemical arrangement is regarded as saline, but on the contrary the exceptions are very numerous. The characters of this order therefore are now drawn rather from the chemical composition of the substances arranged under it. It is thus understood as comprehending the acids, the alkalis, and the compounds resulting from the combination of acids with alkalis, earths, and metallick oxides. The acids and alkalis are named simple or primitive salts; the others secondary, or more commonly neutral salts, as in general the properties of the acid, and of the alkali, earth or metal of which they are formed, are neutralized or lost.

Acidum Sulphuricum Dilutum. *Diluted Sulphurick Acid.* Diluted Vitriolick Acid.

Take of
Sulphurick acid, one ounce,
Water, seven ounces.

Mix them gradually.

The most simple form, in which sulphurick acid can be employed internally, is that in which it is merely diluted

with water; for which it has a great attraction: and their bulk, when combined, is less than that of the water and acid separately. At the same time there is a very considerable increase of temperature produced, which is apt to crack glass vessels, unless the combination be very cautiously made; and for the same reason, the acid must be poured into the water, not the water into the acid. Distilled water is preferable to spring water.

This preparation was formerly called weak spirit of vitriol, and has been considered as a useful astringent, taken to the extent of thirty drops; but its medicinal properties have already been mentioned under the article Acidum Sulphuricum, in the materia medica.

ACIDUM NITROSUM. *Nitrous Acid.* Glauber's Spirit of Nitre.

Take of

Nitrate of potass in coarse powder, or bruised, two pounds,

Sulphurick acid, sixteen ounces.

Having put the nitrate of potass into a glass retort, pour upon it the sulphurick acid, and distil it in a sand bath, with a heat gradually increased, until the iron pot begin to be red hot.

The specifick gravity of this acid is to that of distilled water as 1550 to 1000.

In this process, the sulphurick acid, by its superiour affinity, combines with the potass of the nitre to form sulphate of potass, while the nitrick acid is separated, and is not only converted into vapour by the application of the heat to the retort, but is also partially decomposed. A portion of oxygen escapes in a gaseous form, and the nitrick oxide gas combines with the nitrick acid; so that the liquor condensed in the receiver is nitrous, and not nitrick acid.

ACIDUM NITROSUM DILUTUM. *Diluted Nitrous Acid.* Aqua Fortis Tenuis.

Take of

Nitrous acid,

Water, equal weights.

Mix them, taking care to avoid the noxious vapours.

In combining nitrous acid with water, the greater part of the nitrous gas of the former is disengaged. The diluted acid is employed in a number of the chemical processes of the pharmacopœia.

ACIDUM NITRICUM. *Nitrick Acid.* Aqua Fortis.

Take of

Nitrous acid, any quantity.

Pour it into a retort, and having adapted a receiver, apply a very gentle heat, until the reddest portion shall have past over, and the acid which remains in the retort shall have become nitrick acid.

By the heat applied, the nitrous gas contained in the nitrous acid, and which gives to it the yellow colour and highly fuming property, is expelled, and condenses in the receiver, combined still with a small portion of acid.

The nitrick acid remains colourless. It is applied to the same purposes as the nitrous. Little or no difference can exist between them in medicinal powers, but the nitrick is perhaps more uniform in strength.

These acids, the nitrous and nitrick, have been long employed as powerful pharmaceutick agents. They are next in strength to the sulphurick, and dislodge all others from alkaline salts or earths. Under the name of *aqua fortis*, the nitrous acid of a certain strength has long been employed for various purposes in the arts and manufactures. Great caution should be observed in the use of this powerful liquid. In casualties where a person has, by mistake, swallowed a portion of *aqua fortis*, luke warm water ought to be drunk in the greatest possible quantity, even to the amount of several gallons, to weaken the causticity of the poison, and to avert the imminent danger of suffocation. Next, a solution of half an ounce of salt of tartar, or clear pearl ashes, in one pint of water, should be taken in about six or eight draughts; and as the effervescence thus occasioned in the stomach, greatly tends to weaken that organ, it will be necessary to make use of more water, and other diluent, oily, or mucilaginous drinks.

The use of the nitrous and nitrick acids in medicine, has lately been considerably extended.

In the state of vapour, they have been used to destroy contagion in jails, hospitals, ships, and other places where the accumulation of animal effluvia is not easily avoided.

The fumigating such places with the vapour of nitrous acid has certainly been attended with success; but we have heard that success ascribed entirely to the ventilation employed at the same time. Ventilation may certainly be carried so far, that the contagious miasmata may be diluted to such a degree, that they shall not act on the body; but to us it appears no less certain, that these miasmata cannot come in contact with nitrick acid or oxymuriatick acid vapour, without being entirely decomposed, and completely destroyed. It is, besides, applicable in situations which do not admit of sufficient ventilation; and where it is, the previous diffusion of acid vapours is an excellent check upon the indolence and inattention of servants and nurses, as by the smell we are enabled to judge whether they have been sufficiently attentive to the succeeding ventilation. Nitrick acid vapour, also, is not deleterious to life, and may be diffused in the apartments of the sick, without occasioning to them any material inconvenience. The means of diffusing it are easy. Half an ounce of powdered nitre is put into a saucer, which is placed in a pipkin of heated sand. On the nitre two drachms of sulphurick acid are then poured. The fumes of nitrick acid immediately begin to rise. This quantity will fill with vapour a cube of ten feet; and by employing a sufficient number of pipkins, the fumes may be easily made to fill a ward of any extent. After the fumigation, ventilation is to be carefully employed. For introducing this practice, Dr. Carmichael Smyth has received from the British parliament a reward of five thousand pounds.*

* It is remarkable that, while Dr. C. Smyth insists upon the efficacy of the *nitrous vapour*, M. Guyton de Morveau is equally positive, that the suffocating fumes of the *muriatick acid* are the most certain destroyers of contagion. The plans both of Morveau and Smyth, founded on the principle of the alkaline nature of contagion, are in direct opposition to the theory of *septic acid*, suggested by the ingenious Dr. Mitchell, of New York. It may be of little importance whether the nitrous, or the muriatick acid be employed, as the powers of both are extensive and certain.—When the muriatick is preferred, one pound of muriate of soda is put into an earthen vessel, and a small quantity of *sulphurick acid* is poured over it until the whole salt is moistened. If a gentle heat be applied, a larger quantity of vapour will be extricated. In every hospital, garrison, jail, ship, or any other crowded place, or even in private dwellings, on the appearance of any infectious disorder, we should not fail to advise the employment of these acid fumigations.

The internal use of these acids has also been lately much extended. In febrile diseases, water acidulated with them forms one of the best antiphlogistick and antiseptick drinks we are acquainted with. Hoffman and Eberhard long ago employed it with very great success in malignant and petechial fevers; and in the low typhus, which frequently rages among the poor in the suburbs of Edinburgh, it has been repeatedly given with unequivocal advantage. In the liver complaint of the East Indies, and in syphilis, nitrick acid has also been extolled as a valuable remedy, by Dr. Scott, and the evident benefits resulting from its use in these complaints, has given rise to a theory, that mercury only acts by oxygenizing the system. It is certain, that both the primary and secondary symptoms of syphilis have been removed by the use of these acids, and that the former symptoms have not returned, or been followed by any secondary symptoms. But in many instances they have failed, and it is doubtful if ever they effected a permanent cure, after the secondary symptoms appeared. Upon the whole, the opinions of Mr. Pearson on this subject, lately agitated with so much keenness, appear to us so candid and judicious, that we shall insert them here. He does not think it eligible to rely on the nitrous acid in the treatment of any one form of the lues venerea; at the same time, he by no means wishes to see it exploded as a medicine altogether useless in that disease. When an impaired state of the constitution renders the introduction of mercury into the system inconvenient, or evidently improper, the nitrous acid will be found, he thinks, capable of restraining the progress of the disease, while at the same time, it will improve the health and strength of the patient. On some occasions, this acid may be given in conjunction with a mercurial course, and it will be found to support the tone of the stomach, to determine powerfully to the kidneys, and to counteract in no inconsiderable degree the effects of mercury on the mouth and fauces.

The common method of giving the nitrick acid at first, is to mix one drachm with a pint of water, the mixture being sweetened with simple syrup. This quantity is to be taken at different times, in the course of twenty-four hours, through a glass tube or quill, which is used to prevent the teeth from being injured. If no inconvenience is felt, the dose of the acid may be increased to two, and even in certain cases to three drachms.

The diluted nitrous acid has recently been given in cases of stone in the bladder, forty drops were given every two hours till a sediment appeared in the urine of an impalpable powder. It was continued for five months till twenty-seven ounces were ultimately taken. The sediment collected amounted to six hundred grains.

ACIDUM MURIATICUM. *Muriatick Acid.* Spirit of Sea Salt.

Take of
Muriate of soda, two pounds,
Sulphurick acid, sixteen ounces,
Water, one pound.

Let the muriate of soda be kept at a red heat for some time in an iron vessel, and after it has cooled, put it into a retort; then pour upon the muriate of soda, the acid mixed with the water and allowed to cool. Lastly, distil in a sand bath, with a moderate fire, as long as any acid is produced.

The specifick gravity of this acid is to that of distilled water, as 1170 to 1000.

This process is an example of single affinity. The sulphurick acid combines with the soda of the muriate of soda, and the muriatick acid is disengaged. It combines with the watery vapour, and is thus easily condensed. It has generally a yellowish tinge, from the presence of a small quantity of iron, from which it can be freed by a second distillation.

The spirit of sea salt is the weakest of the mineral acids, but stronger than any of the vegetable. In its effects on the animal economy, and the mode of its employment, it coincides with the acids already mentioned, which almost proves that they do not act by oxygenizing the system, as the muriatick acid cannot be disoxygenized by any substance or process with which we are acquainted. This preparation is sometimes given, properly diluted, as an antiphlogistick, aperient, and diuretick, from ten to sixty or seventy drops.

Dr. Reich, of Erling, in Franconia, has cured the malignant putrid fevers, by the liberal use of mineral acids, and particularly the muriatick, or spirit of sea salt. Sir William Fordyce, also recommends it as the best remedy in all putrid diseases of the worst kind; in petechial,

cramp, and jail distempers, as well as the malignant sore throat, small pox, and plague.

Dr. Reich directs a mixture of from one drachm to half an ounce of the acid, eight ounces of water and two of syrup; the patient to take a tablespoon full or more every hour or two hours. But in time of great danger, from forty to one hundred drops, properly diluted, may be given at once, and such doses often repeated. The internal exhibition, however, of this powerful remedy, is liable to many serious objections, which must ever prevent its general adoption. But it may in all cases be safely applied in the form of liniments, fomentations, and baths: thus a very large and much larger proportion than by swallowing it, may be daily, nay, hourly introduced into the system, especially in the earlier stages of the disorder, before the patient's strength is too much exhausted.

Dr. Robert Thomas, author of the Modern Practice of Physick, observes, that the effects of the mineral acids, more particularly the muriatick, in all febrile diseases of a malignant nature are truly great, and from employing them for several years, in all such cases, his practice has been attended with the most decided success, and he cheerfully vouches for their efficacy. He prescribes to adult patients ten or twelve drops of the muriatick acid, guarded with five drops of tinctura opii, with an infusion of columbo, after proper evacuations have been made, and increases the dose to eighteen or twenty drops every four hours.

The muriatick acid has recently been successfully employed in cases of stone in the bladder, as related by Dr. Copeland. Beginning with thirty drops, it was increased to fifty, and so on, till two ounces were taken daily. The stone was dissolved, and the sediment collected in the urine amounted to one hundred and four grains.

Acidum Acetosum Destillatum. *Distilled Acetous Acid.* Distilled Vinegar.

Let eight pounds of acetous acid be distilled in glass vessels with a gentle heat. The two first pounds which come over, being too watery, are to be set aside; the next four pounds will be the distilled acetous acid. The remainder furnishes a still stronger acid, but too much burnt by the fire.

Vinegar, as it is produced by fermentation, consists of acetous acid, largely diluted with water, and mixed with a number of other substances. From these it is purified by distillation; but it is still largely diluted with water, as the pure acid is not even so volatile as water; and, in general, it receives from the distillation somewhat of an empyreumatick odour. The process should be conducted in glass vessels, as directed in the pharmacopœia; as, from metallick ones, the acid would receive an impregnation that might prove noxious.

Distilled acetous acid is chiefly employed as a solvent of some vegetable substances, and in making some of the salts.

ACIDUM ACETOSUM FORTE. *Strong Acetous Acid.*

Take of

Sulphate of iron dried, one pound,
Acetite of lead, ten ounces.

Having rubbed them together, put them into a retort, and distil in a sand bath with a moderate heat, as long as any acid comes over.

The London pharmacopœia directs this acid to be procured by the distillation of verdigris, and it is somewhat uncertain whether the two products differ essentially from each other, and whether these concentrated acids differ, except in strength, from the diluted acetous acid.

These strong acids are principally used as powerful stimulants, applied to the nostrils in languor and asphyxia. Their odour is pungent and grateful. They are capable of acting as powerful rubefacients.

ACIDUM BENZOICUM. *Benzoick Acid.* Flowers of Benzoin.

Take of

Benzoin, twenty-four ounces,
Carbonate of soda, eight ounces,
Water, sixteen pounds.

Triturate the benzoin with the carbonate, then boil in the water for half an hour, with constant agitation, and strain. Repeat the decoction, with other six pounds of water, and strain. Mix these decoctions, and evaporate, until two pounds remain. Filter anew, and drop into the fluid, as long as it produces any precipitation,

Diluted sulphurick acid.

Dissolve the precipitated benzoick acid in boiling water; strain the boiling solution through linen, and set it aside to crystallize. Wash the crystals with cold water, dry and preserve them.

The benzoick acid when properly prepared has an agreeable taste and fragrant smell. It totally dissolves in alcohol, and likewise by the assistance of heat in water; but separates again from the latter upon the liquors growing cold, shooting into saline spiculæ, which unite together in irregular masses. By the mediation of sugar, flowers of benzoin remain suspended in cold water, and thus form an elegant balsamick syrup. Some have held them in great esteem as pectoral and sudorifick, in the dose of half a scruple or more; but at present they are rarely used, except as an ingredient in the composition of the paragorick elixir of the pharmacopœia.

OLEUM SUCCINI ET ACIDUM SUCCINICUM. *Oil of Amber and Succinick Acid.* Salt and Oil of Amber.

Take of

Amber reduced to powder, and of pure sand, equal weights.

Mix them, and put them into a glass retort, of which the mixture may fill one half; then adapt a large receiver, and distil in a sand bath, with a fire gradually increased. At first a watery liquor will come over, with some yellow oil; then a yellow oil with an acid salt; and lastly, a reddish and black coloured oil. Pour the liquor out of the receiver, and separate the oil from the water. Press the salt collected from the neck of the retort and sides of the receiver, between folds of blotting paper, to free it from the oil adhering to it; then purify it by solution in warm water and crystallization.

We are not acquainted with any experiments which determine whether the succinick acid exists as such in the amber, or whether it be a product of the decomposition of the amber by the action of heat; for in the process employed for obtaining succinick acid, the amber is completely decomposed.

Succinick acid, formerly salt of amber, has a penetrating subastringent acid taste. It dissolves both in water and in rectified spirit; though not readily in either, and scarcely at all in the latter, without the assistance of heat. It

effervesces with alkalis, and forms with them neutral compounds much resembling those composed of the same alkalis and vegetable acids. It was formerly in repute as an aperient, diuretick, and antihysterick, but in modern practice it is little regarded.

The oil of amber is sometimes employed externally as a stimulant, and internally as an antispasmodick, but is also falling into disuse. A process is ordered in the pharmacopœia for its purification.

This oil, combined with the nitrick acid, forms the artificial musk. See musk.

Aqua Acidi Carbonici. *Water of Carbonick Acid.* Water impregnated with fixed air. Seltzer water.

Take of

Water, six pounds; place this in the middle part of a Nooth's apparatus, and expose it to a stream of carbonick acid gas arising from
Carbonate of lime, in powder,
Sulphurick acid, each three ounces,
Water, three pounds, gradually and cautiously mixed.

If a larger quantity of the liquor be required, the apparatus of Dr. Woulfe is preferable.

In this and similar preparations, where carbonick acid gas is combined with liquids, the liquor is better in proportion to the coldness of the air, and to the pressure to which it is subjected. It should be preserved in glass vessels well closed, and should not be exposed to any high temperature.

In this process the carbonick acid is separated from the carbonate of lime by the superiour affinity of sulphurick acid. As it is disengaged, it assumes a gaseous form, and would be dissipated in the atmosphere, if it were not made to pass through water, which, at a medium temperature, is capable of absorbing about an equal bulk of this gas, and, by the assistance of pressure, a much greater proportion.

Various contrivances have been made for this purpose. Of these the most easily managed, and most convenient for general use, is the apparatus of Nooth, and for larger quantities that of Woulfe, or some modification of it. By the proper application of pressure, Mr. Paul is able to

impregnate water, with no less than six times its bulk of carbonick acid gas.

Water. impregnated with carbonick acid, sparkles in the glass, has a pleasant acidulous taste, and forms an excellent beverage. It diminishes thirst, lessens the morbid heat of the body, and acts as a powerful diuretick. It is also an excellent remedy in increased irritability of the stomach, as in advanced pregnancy; and it is one of the best anti-emeticks we possess.

Acidum Prussicum. *Prussick Acid.*

"Take of

Prussiate of iron, four ounces,
Nitrick oxide of mercury, two ounces and a half,
Distilled water, one pint.

"Boil in a glass vessel until the oxide of mercury has wholly disappeared; filter the solution, and afterwards pour upon the strainer three fluid ounces of hot distilled water. Pour the filtered solution into a long necked and tubulated glass retort, and adapt a receiver containing one fluid ounce of distilled water. The receiver should have a bent tube extending from it to a cup of water, to carry off the hydrogen gas. Introduce two ounces of purified iron filings through the tubulure into the retort, and afterwards, two ounces (by weight) of sulphurick acid. Surround the receiver with ice or very cold water, and distil without boiling, from a sand bath, three ounces."

"Prussick acid is a colourless fluid, of a strong smell, like that of peach flowers or bitter almonds, and a sweetish pungent taste. It does not redden vegetable blues. It is easily decomposed by light, heat, and chlorine. It does not act upon the metals, but forms coloured and generally insoluble combinations with their oxyds. It has a great tendency to form triple salts with alkaline and metallick bases. It is obtained from animal substances by the action of heat, nitrick acid, fixed alkalis, and putrefaction."

The principal information we possess relative to the physical properties and medicinal virtues of the prussick acid, is derived from a publication by Dr. A. B. Granville, a respectable English physician. According to this author, the prussick acid is a more powerful sedative than opium, though its specifick mode of action is some-

what different. It appears to exert an immediate influence upon the nervous system, gradually diminishing all irritability, and checking a too rapid circulation. It has never been found to produce the headache and heaviness occasioned by laudanum; the fluttering and palpitation brought on by hemlock; nor the parched mouth and irritability of the throat, arising from the action of belladonna. The diseases in which, in the hands of the author referred to, this medicine has proved beneficial, are, almost every kind of cough, particularly of a spasmodick nature. In the dry convulsive spasmodick cough, which may be called sympathetick, as depending entirely on a morbid state of the liver, stomach, spleen, &c. it was employed with success. Hooping cough, he asserts, need in no case be suffered to proceed longer than eight or ten days if the prussick acid be timely and cautiously administered; and it is singular that children bear the action of this sedative medicine in small doses better than adults. In hectick fever it affords ease; lowers the pulse; diminishes the number of paroxysms, and the night sweats are soon suspended. In the treatment of confirmed consumption the prussick acid even at the approach of death is the most advantageous palliative that can be employed. Asthmatick complaints are also stated to have been greatly relieved by it; and from analogy the author is sanguine enough to expect much benefit from it in spasms of the stomach and diaphragm; and even in locked-jaw, tic doloureux, and hydrophobia. In inflammatory affections of the lungs, with a tendency to recur on the slightest cause, and to terminate in hectick and purulent expectoration, and after depletion cannot be carried any further, Dr. G. thinks the prussick acid will produce the most advantageous effects; and also in those pains which attend and follow abortions, and in hæmoptysis. The author, with Dr. Magendie and others, concur in stating several cases illustrative of the favourable effects of this medicine, and in the observation that no bad effects had ever resulted from its use, though great caution is admitted to be requisite in its exhibition. In the same volume Mr. Thompson details four successful cases in which he exhibited the prussick acid; and observes that he had prescribed it in a great number of instances with variable success; but the benefit it has produced is amply sufficient to authorize him to add his testimony in favour of its value as an important addition to the host of direct

sedatives. In directing to the mode of prescribing the prussick, or hydro-cyanick acid, it is observed that it decomposes most of the salts used in medicine, particularly those of antimony and soda. Its affinity for the alkalis and earths is inconsiderable; that of the former is so weak, that even carbonick acid displaces it. Hence it may be given with carbonate of potash, forming one of the most successful modes of prescribing it in spasmodick and hooping coughs. It cannot be administered with the sulphurets. It may be given in vegetable infusions, with the addition of syrups if necessary. With tonicks it may be associated with real advantage, as with the filtered infusions of bark, columbo, cascarilla, or even sarsaparilla, or in incipient pulmonary complaints in a strong decoction of lichen islandicus. It is indispensably necessary to use no other than distilled water in all prescriptions with the prussick acid; otherwise decomposition will take place. Of a formula consisting of six or eight ounces of distilled rose water, and eight or ten minims of the acid, a table spoonful may be given every two or three hours. When the prussick acid produces nausea, vomiting, or dizziness, which it will do in some individuals on the very first or second day, it is advisable to abandon it immediately, for there is no chance of its ever agreeing with the patient; but such effects have not occurred above five or six times in one hundred cases in which it has been exhibited. During the first days it proves gently aperient; and when it has this effect, the mildest purgatives will suffice to produce the necessary evacuation.

Mr. Thompson states his general practice in catarrhal affections and chronick coughs to have been, after purging, to give two minims of the acid in a spoonful of distilled water or almond emulsion, every two or three hours during the day, increasing the quantity two or three minims on the whole portion taken in the twenty-four hours, every day, until the cough was subdued. The greatest amount to which it has been carried by him was twenty-four minims in the day to an adult, and six to an infant. For infants between four months and a year old, he prescribed two minims in nine drachms of distilled water, with one drachm of the syrup of tolu, coch. min. ji. 3tiis. horis sumenda. As to its modus operandi, he observes, the prussick acid, when taken into the stomach, produces its action on the circulating system, evidently

through the medium of the nerves, the energy of which it considerably lessens and even altogether destroys when the dose is sufficiently strong. In no case has he remarked that any excitement precedes its sedative effect, a circumstance which distinguishes it from every other substance belonging to the class of narcoticks.

Dr. Magendie read his paper on the use of the hydrocyanick acid before the royal academy of sciences of Paris, 17th November, 1817, in which he asserts that he prescribed it in certain diseases of the chest, particularly phthisis pulmonalis about three years before. This excited the attention of physicians in England, to the subject, and in 1819, Dr. Granville published his treatise entitled further observations on the internal use of prussick acid. Here an opportunity presents for asserting the just claims of a respectable physician who first employed the prussick acid in the United States. B. Lynde Oliver, M. B. of Salem, Mass. commenced his researches and investigations into the nature and properties of this medicine as early as December, 1810.* In October, 1811,

*During a correspondence from December, 1810, to July, 1812, Dr. Oliver apprized me that he had seen in a medicine chest put up in Naples directions for the use of the aqua laurocerasi for the cure of virulent gonorrhœa, and was informed by the captain of the ship, that on his passage from that port he cured thirty sailors with that remedy. That professor Werzer, of Bonn, found the laurel water to diminish the too great irritability of the heart and muscular fibre, and augments at the same time the action of the absorbent vessels. These properties Dr. O. observes are exactly what we should expect to find in a medicine capable of curing phthisis pulmonalis. He was therefore induced to make trial of the laurel water in a case of phthisis, and in the course of six weeks he administered two ounces of that medicine with apparently the happiest effects, and no unpleasant symptoms followed. Twice during the trial it was suspended for a short time, but having experienced its beneficial effects, the patient requested a repetition of its use. Having expended his small stock of laurel water, and also a tincture of the leaves of laurocerasus received from the late professor Barton, and reflecting that the prussick acid is the efficient principle in the laurocerasus, he directed it to be prepared for his use as mentioned above. Thus it evidently appears justly due to Dr. O. to affirm that he was not only the first in the United States who employed the prussick acid, but that he was actually the discoverer of its properties and efficacy in relieving and sometimes curing phthisis pulmonalis, even before it was known or promulgated in Europe. He also

he directed some of the acid to be prepared according to the process of Dr. Schaub. This under his special direction was accomplished by Mr. Hunt, apothecary and chemist, and being administered to a near relative labouring under phthisis, the result was a permanent cure; and in other instances about the same period it contributed essentially to retard the progress of hectick fever. In subsequent practice Dr. Oliver has experienced the efficacy of the acid in various painful diseases as a powerful sedative and antispasmodick. It has proved a valuable remedy in asthma, and in a case of pleurodyne, in a patient who had frequently been bled for the same affection, a few doses of the acid soon removed every symptom. It has in his hands and of professor Mussey, of Hanover, by his recommendation, proved emenagogue, and in one or two instances of mania in females it has afforded essential relief and benefit. One patient, a young woman, had a severe cough, and three doses entirely cured her. I can with truth, says Dr. O., affirm, that of all the various medicines which I have given, I have never found one which operated so suddenly, particularly in asthma, influenzy, and hooping cough. The dose in which he prescribes the acid, is, for an adult six drops every six hours in distilled rose water; increasing gradually until headache or some other unpleasant sensation be excited. It is remarkable that sometimes the addition of a single drop is perceptibly unpleasant to the patient. The preparation which Dr. O. employed was somewhat below the common strength; when the stronger preparation is used, safety requires that the commencing dose should not exceed two drops. The fact is not to be concealed that in the hands of Dr. O., as in many others, this medicine has occasionally disappointed every expectation by proving entirely inoperative. In the American Medical Recorder, vol. 4th, p. 145, is a statement by Dr. Coats, of the employment of the hydrocyanick acid in the Pennsylvania hospital in the summer of 1819. The preparation was of such strength that one drop placed on the tongue of a

suggested this as a probable remedy in hydrophobia; and in one instance of this malady which occurred, he administered the prussick acid combined with other remedies, but from the impaired quality of the medicine, and the advanced stage of the disease, no decisive judgment respecting its effects could be formed.

half grown cat, destroyed life completely in twenty-seven seconds. More than two drops in diluted solution could rarely be taken, without considerable inconvenience in twenty-four hours. When, however, in two or three weeks, it had lost much of its strength, it was replaced by a fresh parcel. It was given with the view of lessening irritability and sensibility in nervous pains and in mania. In two cases of severe chronick rheumatism, and in one of mania, the prussick acid was eminently serviceable, and in combination with subsidiary means effected permanent cures. In professor Silliman's journal, vol. 4, several examples of catarrhal affections, attended with membranous irritation, cough, &c. both recent and chronick are stated, in which the prussick acid proved a medicine of peculiar powers. Many respectable physicians in Boston have administered the acid in hooping cough, and in various other affections, with satisfactory success. In hooping cough, it is found to be a remedy of efficacy, reducing the inflammatory excitement when the feeble state of the patient and irritability of the pulse render the use of the lancet inadmissible.

Dr. Granville asserts, that no case has yet been recorded, in which the prussick acid has proved either fatal or injurious; and others, who have used it extensively have given a similar assurance; but practitioners ought to be extremely cautious how they place implicit confidence in the virtues and curative powers ascribed to this medicine, or suffer themselves to be seduced by assurances, that it may, in all cases, be administered with perfect impunity. I have received reports of its having in several instances produced deleterious effects. In a child to whom it was given for hooping cough, its effects were so alarming, that it was immediately abandoned. In the last number of the New England Medical Journal several cases of the deleterious effects of the prussick acid are stated, although administered with the requisite precautions. In fact, much of the properties and effects of this very active medicine remain to be developed by experience and attentive observation. It is obviously of the first importance that the process for its preparation should be uniformly the same, that it be preserved as much as possible from decomposition, that distilled water be the vehicle of its administration, and finally that the commencing dose in every instance be small and gradually increased. It is, moreover, desirable, that in all instances

of its extraordinary powers being manifested, whether sanative or otherwise, the particulars should be communicated to the publick.

From the extremely delicate nature of the prussick acid, the difficulty of preserving it from decomposition, and the nicety to be observed in its administration, it is desirable that the efficient principle of the medicine should be obtained in a different form. It is highly probable that a saturated tincture of the leaves of the lauro cerasus, or a distilled water from the same, may be employed with most of the advantages derivable from the prussick acid. Both of these preparations were administered by Dr. Oliver, in 1810 and 1811. The result of his trials answered his expectations, and gave him confidence in the properties of the prussick acid.

After this article was prepared for the press it was announced to me by Dr. Oliver that he is in possession of the second edition of Dr. Granville's treatise on the prussick acid, published in 1820. In this work is a letter from W. H. Rutland, stating that he had given the hydrocyanick acid in several cases of spasmodick cough in old people, in pneumonick inflammation in children, and in two cases of severe cynanche trachialis with the happiest results. In one of these, its use was preceded by emeticks, topical and general bleeding, blisters, &c. but still the symptoms continued to an alarming degree, and the spasm of the muscles of the glottis so severe as to threaten suffocation. The beneficial influence of the acid was soon apparent, and the young patient rapidly recovered. One of the cases of this disease in which the prussick acid was given, was particularly striking, as well from the severity of the symptoms as from the coincidence of other circumstances. Four children in a neighbouring village were attacked nearly at the same time with severe symptoms of croup, three of whom fell victims to the disease; although in two of the cases the most active judicious treatment, agreeably to the general mode of combating this disease, was adopted by a practitioner of the highest respectability and extensive experience.

In the same work are given seventy-nine cases of various diseases which were cured or relieved by the new remedy. Of these many were of incipient phthisis cured, and several in the advanced stages also. Dr. Granville remarks, that the hydrocyanick acid can be

employed as the best palliative in cases of confirmed tuberculated consumption; and that in some well authenticated *instances* it appears to have effected a *cure* of that *disorder*.

In another English work on the same subject, by Dr. John Elliotson, there is, says Dr. Oliver, the most ample evidence of the efficacy of the prussick acid in hooping cough, spasmodick asthma, in cases resembling angina pectoris, and in pyrosis, and various diseases of the stomach; in which last affections he pronounces it to be superiour to oxid of bismuth. One case of chorea he mentions, was soon cured by it. He speaks of the medicine in strong terms of commendation, having had in St. Thomas's hospital ample opportunities of trying it. Dr. Elliotson further remarks, that the hydrocyanick acid must, he fears, be added to our list of medicines that have been fruitlessly tried to cure consumption. He has employed it in vain too often both at the commencement and advanced stage of phthisis to believe it to be a remedy in this disease.

Aqua Potassæ. *Solution of Potass.* Water of Potass. Caustick Ley.

Take of

Lime recently burnt, eight ounces,
Carbonate of potass, six ounces.

Throw the lime into an iron or earthen vessel, with twenty-eight ounces of warm water. After the ebullition is finished, instantly add the salt; and having thoroughly mixed them, cover the vessel till they cool. When the mixture has cooled, agitate it well, and pour it into a glass funnel, whose throat must be stopt up with a piece of clean rag. Let the upper mouth of the funnel be covered, while the tube of it is inserted into another glass vessel, so that the solution of potass may gradually drop through the rag into the lower vessel. When it first gives over dropping, pour into the funnel some ounces of water; but cautiously, so that the water may swim above the matter. The water of potass will again begin to drop, and the affusion of water is to be repeated in the same manner, until three pounds have dropped, which will happen in the space of two or three days; then by agita-

tion mix the superiour and inferiour parts of the liquor together, and put it up in a well stopt phial.

The principle of mildness in all alkaline salts, whether fixed or volatile, vegetable or fossil, is very evidently carbonick acid. But quick lime has a stronger attraction for the acid than any of the salts. Of course, when lime comes in contact with carbonate of potass, as in the above process, the carbonick acid quits the potass to unite with the lime, and the results of the mixtures are potass and carbonate of lime. Now as the carbonate of lime is insoluble in water, and the potass is very soluble, they may be separated by filtration. The method of filtrating through sand, as employed by Dr. Black, is preferable to any other.

The caustick ley is to be considered as a solution of pure alkali in water. It is colourless, and will neither effervesce with acids, nor form a precipitate with carbonate of potass. The solution of caustick potass, under various names, has at different times been celebrated as a lithontriptick, and as often fallen again into disuse. The very contradictory accounts of its effects as a solvent are now in some degree explicable, since it has been discovered that urinary calculi are very different in their natures, so that some of them are only soluble in acids, and others only in alkalis. Of the last description are the calculi of urick acid, which are very frequent, and those of urate of ammonia. On these, therefore, alkalis may be supposed to make some impression; and that alkalis, or alkaline carbonates, taken by the mouth, have occasionally relieved calculous complaints, is certain. It is, however, said, that their continued use debilitates the stomach; and M. Fourcroy has proposed applying the remedy immediately to the disease, by injecting into the bladder a tepid solution of potass or soda, so dilute that it can be held in the mouth. Before the alkaline solution be injected, the bladder is to be completely evacuated of urine, and washed out with an injection of tepid water. After the alkaline injection has remained in the bladder half an hour or more, it is to be evacuated and allowed to settle. If, on the addition of a little muriatick acid, a precipitate be formed, we shall have reason to conclude that the calculus contains urick acid, and that the alkali has acted on it.

Very dilute alkaline solutions may also be taken into the stomach as antacids, but we possess others which are

preferable. The dose is from ten to thirty drops. Externally, alkaline solutions have been more frequently used, either very dilute, simply as a stimulus, in rickets, gouty swellings, gonorrhœa, and spasmodick diseases, or concentrated as a caustick to destroy the poison of the viper and of rabid animals.

POTASSA. *Potass.* Strongest Common Caustick.

Take of

Solution of potass, any quantity.

Evaporate it in a covered very clean iron vessel, till, on the ebullition ceasing, the saline matter flows gently like oil, which happens before the vessel becomes red. Then pour it out on a smooth iron plate; let it be divided into small pieces before it hardens, and immediately placed in a well stopped phial.

Potass in this form is used as a caustick. It quickly erodes animal matter, and, mixed with soap, has been used to open an ulcer. But its use as a caustick is inconvenient, from its being so quickly affected by the air, and from its rapid deliquescence, which renders it apt to spread.

POTASSA CUM CALCE. *Potass with Lime.* Milder Common Caustick.

Take of

Solution of potass, any quantity.

Evaporate this in a covered iron vessel till one third remain; then mix with it as much new slack lime as will bring it to the consistence of a pretty solid pap, which is to be kept in a vessel closely stopped.

The addition of the lime in this preparation renders it less apt to deliquesce, more easily managed, and milder in its operation than the former.

CARBONAS POTASSÆ. *Carbonate of Potass.* Fixed vegetable Alkaline Salt purified.

Let impure carbonate of potass, put into a crucible, be brought to a low red heat, that the oily impurities, if there be any, may be consumed; then triturate it with an equal weight of water, and mix them thoroughly by agitation. Filtrate the liquor through paper into a very

clean iron pot, and boil to dryness, stirring the salt towards the end of the process, to prevent its sticking to the vessel.

The pearl ashes of commerce are obtained by the incineration of the wood of land vegetables. They contain a considerable proportion of foreign salts, from which they are in a great degree purified by the present process. The salt thus obtained is a subcarbonate of potass, or potass imperfectly saturated with carbonick acid. It is in white grains, is deliquescent, and possesses the alkaline properties. In like manner is purified impure kali from the ashes of any kind of vegetable.

The same salt may be prepared from tartar which must be burnt until it become of an ash colour.

The following easy and cheap method of preparing carbonate of potass, (sal aeratus) by saturating the vegetable alkali with carbonick acid, is recommended by that venerable and eminent physician, E. A. Holyoke, M. D. of Salem.

Take a cylindrical box of wood, about nine or ten inches in diameter, bore eight or ten holes, half an inch in diameter, in the side of it, just below the lower edge of the cover, at nearly equal distances all around; bore also as many holes in the circular bottom of the box, close to the edge of it: then take another box of the same kind, but of a smaller diameter by half or three quarters of an inch; place this in the larger, and to keep it steady, thrust three or four wooden wedges between the two boxes. The two boxes being thus prepared, fill the inner one with the purest salt of tartar, or clean, well calcined pearl ashes, or any clean, pure fixed vegetable alkali: put its cover on the outer box, leaving the inner one uncovered; sling this double box thus filled, with a cord, and suspend it in a distiller's vat or cistern, while the wash is fermenting, a little above the liquor, or in an empty cistern, if it has been much used, and still retains the fixed air (carbonick acid;) let it remain in this situation for six weeks or two months, or longer if it is not wanted; let it then be taken out, and the salt now fully saturated with the acid, be exposed to the sun and air to dry.

The salt thus prepared, does neither effloresce nor deliquesce in the open air, and for all common purposes is, I believe, equal to that prepared by crystallization.

Note. The pearl ashes had better be put into the box in moderate sized lumps than in powder, that the fixed air may have free access to it.

The salt is much more tolerable to the palate, and may be taken in larger doses than the naked alkali; and as it is decomposed by vegetable acids, as well as the mineral, it may be exhibited instead of the alkali, in perhaps every case where the latter is proper, unless the fixed air is judged improper.

It is much superiour to common alkali in forming Riverius' anti-emetick effervescing draught, as it contains a much larger proportion of carbonick acid (in which the principal virtue of that medicine is supposed to reside) than the mildest fixed alkali, and is at the same time much more palatable.

The doctor commonly directs two drachms or rather more of this salt, to be dissolved in three ounces of fair water; a large spoonful of this solution, added to the same quantity of good vinegar, or lemon juice, at the instant of swallowing it, makes an agreeable dose. But the taste of this solution is so mild, that, if the prescriber choose, a spoonful of it may be swallowed alone at first, and as much vegetable acid immediately upon it, in which case, none of the gas will be lost.

When acidity abounds in the first passages, a little of this salt added to any bitter infusion, or the dry salt added to powder of columbo, or any peptick powder, is an effectual antacid.

In calculous cases, this salt is recommended by writers, particularly by the celebrated Dr. Cullen, in his materia medica, as being a happy expedient for conveying larger quantities of alkali into the stomach, than it can bear in its natural state. Hitherto, says the doctor, the common mode of preparing the salt for this purpose, I believe, has been by impregnating a solution of fixed alkali with fixed air, by means of Dr. Nooth's machine; but any one who has prepared the medicine in both ways, will readily give the most decided preference to that above described, on account both of ease and cheapness.

CARBONAS POTASSÆ PURISSIMUS. *Pure Carbonate of Potass.* Salt of Tartar.

Take of

Impure super-tartrite of potass, any quantity.

Burn it to a black mass, by placing it among live coals, either wrapped up in moist bibulous paper, or contained in a crucible. Having reduced this mass to powder, expose it in an open crucible to the action of a moderate fire, till it become white, or at least of an ash gray colour, taking care that it do not melt. Then dissolve it in warm water; strain the liquor through a linen cloth, and evaporate it in a clean iron vessel, diligently stirring it towards the end of the process with an iron spatula, to prevent it from sticking to the bottom of the vessel. A very white salt will remain, which is to be left a little longer on the fire, till the bottom of the vessel become almost red. Lastly, when the salt is grown cold, keep it in glass vessels, well stopped.

By exposing the super-tartrite of potass to heat, the tartarous acid is decomposed. Parts of its carbon and oxygen unite, and form carbonick acid, which is attracted by the potass; and, by continuing the heat, the remaining carbonaceous matter is burnt out. By dissolving the saline matter, the portion of lime, and any other earthy or metallick matter which the super-tartrite may have contained, are separated, and, by evaporation, a salt is obtained, which, like the former, is a sub-carbonate of potass, but more pure.

Carbonate of potass, formerly called *sal tartari*, is frequently employed in medicine, in conjunction with other articles, particularly for the formation of saline neutral draughts and mixtures: but it is used also by itself in doses from three or four grains to fifteen or twenty; and it frequently operates as a powerful diuretick, particularly when aided by proper dilution.

"In an impaired state of the powers of digestion it is useful; but, combined with tonicks, increases its favourable effects, especially in dropsical cases. A good substitute for it in dropsy is the white ashes made from hickory. Two table spoonfuls dissolved in a pint of water, to which add one table spoonful of soot, a pint of this to be taken in twenty-four hours in divided doses of a wine glass full at a time." [Chapman.]

AQUA SUPER-CARBONATIS POTASSÆ. *Solution of Super-carbonate of Potass.*

Take of
Water, ten pounds,
Pure carbonate of potass, one ounce.

Dissolve and expose the solution to a stream of carbonick acid gas, in the same manner as directed for the water of carbonick acid.

The colder the air is, and the greater pressure, the better is the liquor, which should be kept in well closed vessels. As soon as the preparation is finished, the liquor should be drawn off into pint bottles, which are to be well corked, and kept in a cool situation, with the head down, or laid on one side. It should be perfectly transparent, and have an acidulous, not at all alkaline taste; and when poured out of the bottles, it should have a sparkling appearance.

Potass, when used as a lithontriptick, irritates the stomach and bladder so much, that its use cannot be well long continued. But when super-saturated with carbonick acid, as it is in this preparation, it is much more pleasant and less irritating; and, though its lithontriptick or real solvent power is diminished, or perhaps entirely lost, it is capable of acting as a palliative, and of being continued for any length of time. Indeed, it is the only form in which we can exhibit potass in sufficient doses, and for a sufficient length of time, to derive much benefit from its use in calculous complaints. It has certainly been frequently of advantage in these affections, but probably only in those instances in which the stone consists of urick acid, or urate of ammonia; for although super-saturated with carbonick acid, yet the affinity of that acid for potass is so weak, that it really operates in a degree as an alkali.

Six or eight ounces of this liquor may be taken two or three times a day. It in general proves powerfully diuretick, and sometimes produces inebriation. This last effect is ascribed to the carbonick acid.

ACETIS POTASSÆ. *Acetite of Potass.* Diuretick Salt.

Take of
Pure carbonate of potass, one pound.

Boil it with a very gentle heat, in four or five times its weight of distilled acetous acid; add more acid at different times, till, on the watery part of the preceding quantity being nearly dissipated by evaporation, the new addition of acid cease to raise any effervescence; which will happen, when about twenty pounds of the distilled acetous acid have been consumed. It is then to be slowly dried. The impure salt remaining, is to be melted with a gentle heat, for a short time; and afterwards dissolved in water, and filtered through paper. If the liquefaction have been properly performed, the filtered liquor will be limpid; but if otherwise, of a brown colour. Afterwards evaporate this liquor with a very gentle heat in a very shallow glass vessel, occasionally stirring the salt as it becomes dry, that its moisture may be sooner dissipated. Lastly, the acetite of potass ought to be kept in a vessel very closely stopped, to prevent it from deliquescing.

It is obvious that, in this process, the acetous acid combines with the potass, disengaging the carbonick acid.

The acetite of potass, obtained by the evaporation, is of a brownish colour, from the presence, either of some extractive matter contained in the vinegar, or of carbonaceous matter, from a partial decomposition of the acid. It is freed from this by the fusion which is directed; and, by the second solution and evaporation, it is obtained in the form of a white foliated mass, extremely deliquescent.

Acetite of potass, formerly called *sal diureticus*, provided it be properly made, is a medicine of great efficacy, and may may be so dosed and managed as to prove either mildly cathartick, or powerfully diuretick: few of the saline deobstruents equal it in virtue. The dose is from half a scruple to a drachm or two. A bare mixture, however, of alkaline salt and vinegar, without exsiccation, is perhaps not inferiour as a medicine to the more elaborate salt. Two drachms of the alkali, saturated with vinegar, have been known to occasion, in hydropick cases, ten or twelve stools, and a plentiful discharge of urine, without any inconvenience.

SULPHAS POTASSÆ. *Sulphate of Potass.* Vitriolated Tartar.

Take of

Sulphurick acid, diluted with six times its weight of water, any quantity.

Put it into a capacious glass vessel, and gradually drop into it, of pure carbonate of potass, dissolved in six times its weight of water, as much as is sufficient thoroughly to saturate the acid. The effervescence being finished, strain the liquor through paper; and after due evaporation set it aside to crystallize.

Sulphate of potass may be also conveniently prepared from the residuum of the distillation of nitrous acid, by dissolving it in warm water, and saturating it with carbonate of potass.

In the former of these processes, the sulphurick acid unites with the potass of the carbonate of potass, and expels the carbonick acid with effervescence. In the latter, which is the one generally followed, the excess of sulphurick acid attached to the sulphate of potass, which remains after the distillation of nitrous acid, is saturated by the addition of a sufficient quantity of potass.

Sulphate of potass, formerly *vitriolated tartar*, forms small transparent very hard crystals, generally aggregated in crusts, and permanent in the air. It has a bitter taste, and is slowly soluble in water. In small doses, as a scruple, or half a drachm, it is a useful aperient; in larger ones, as four or five drachms, a mild cathartick, which does not pass off so hastily as the sulphate of soda, and seems to extend its action further.

SULPHAS POTASSÆ CUM SULPHURE. *Sulphate of Potass with Sulphur.* Sal Polychrest.

Take of

Nitrate of potass in powder,
Sublimed sulphur, of each equal parts.

Mix them well together, and inject the mixture, by little and little at a time, into a red hot crucible; the deflagration being over, let the salt cool, after which it is to be put up in a glass vessel well stopped.

The nitrate of potass being decomposed by the red heat, affords oxygen to the sulphur, in such proportions as to convert it into sulphurick and sulphurous acids. Both acids are attracted by the potass. In its medicinal qualities, this saline compound, formerly called *sal polychrestus*, does not appear to differ from the sulphate of potass; and it is soon converted into it by exposure to the air.

SULPHURETUM POTASSÆ. *Sulphuret of Potass.* Liver of Sulphur.

Take of
Carbonate of potass,
Sublimed sulphur, each eight ounces.

Having ground them well together, put them into a large coated crucible; and having fitted a cover to it, and applied live coals cautiously around it, bring them at length to a state of fusion.

Having broken the crucible as soon as it has grown cold, take out the sulphuret, and keep it in a well closed phial.

During the fusion of these two substances, the sulphur and potass combine, and the carbonick acid is disengaged. The compound is easily fusible, and is of a brown colour, and inodorous. It is immediately partially decomposed by water, and portions of sulphate of potass and sulphurated hydrogen formed.

This preparation, formerly called *hepar sulphuris*, (liver of sulphur,) has been proposed to be used as an antidote to some of the metallick poisons, from the supposition that the sulphur would combine with the metallick preparation, and render it inert. From a similar theory it has been imagined that it might obviate the effects of mercury on the system when these are too violent; but is very seldom had recourse to with either intention. The dose in which it has been proposed to be given, is from ten to twenty grains, three or four times a day. It is said in some cases of cancer, to have increased the efficacy of cicuta as a palliative, in doses of five grains.

TARTRIS POTASSÆ. *Tartrite of Potass.* Soluble Tartar.

Take of
Carbonate of potass, one pound,
Super-tartrite of potass, three pounds, or as much as may be sufficient,
Boiling water, fifteen pounds.

To the carbonate of potass dissolved in the water, gradually add the super-tartrite of potass in fine powder, as long as it raises any effervescence, which generally ceases before three times the weight of the carbonate of

potass has been added; then strain the cooled liquor through paper, and, after due evaporation, set it aside to crystallize.

The excess of tartarous acid in the super-tartrite of potass, is saturated by the potass of the carbonate of potass, and the proper neutral salt formed. It is not easily crystallized. In its preparation, therefore, the solution is usually evaporated to dryness. It has an unpleasant bitter taste. It is soluble in four parts of cold water, and still more soluble in boiling water; and it is also soluble in alcohol.

This neutral salt, formerly called *soluble tartar*, is totally or partially decomposed by all acids. On this account it is improper to join it with tamarinds, or such like acid fruits, which is too often done in the extemporaneous practice of those physicians who are fond of mixing different catharticks together, and know little of chemistry.

In doses of a scruple, half a drachm, or a drachm, this salt is a mild, cooling aperient; two or three drachms commonly loosen the belly; and an ounce proves pretty strongly purgative. It has been particularly recommended as a purgative for maniacal and melancholick patients. It is a useful addition to the purgatives of the resinous kind, as it promotes their operation, and at the same time tends to correct their griping quality.

CARBONAS SODÆ. *Carbonate of Soda.* Purified fixed fossil Alkaline Salt.

Take of

Impure carbonate of soda, any quantity.

Bruise it; then boil in water till all the salt be dissolved. Strain the solution through paper, and evaporate it in an iron vessel, so that after it has cooled, the salt may crystallize.

Impure carbonate of soda, the barilla of commerce, is obtained from the incineration of certain marine plants. It consists of carbonate of soda, with charcoal, oxide of iron, and various other impurites. From these it is in a great measure freed by solution and crystallization. It was formerly called *purified fixed fossil alkaline salt*, and has been used principally as a lithrontriptick, under the form of the watery solution super-saturated with carbonick acid, or made into pills with soap; of which half a drachm or a drachm, are taken in the course of the day.

Mr. William Dunn, of Boston, has announced his intention of manufacturing carbonate of soda to any amount which may be required.

AQUA SUPER-CARBONATIS SODÆ. *Solution of Super-Carbonate of Soda.* Soda water.

Take of

Water, ten pounds,
Carbonate of soda, two ounces.

Dissolve and expose the solution to a stream of carbonick acid gas, in the same manner as directed for the water of carbonick acid.

This is the soda water commonly sold in our cities. A pleasant and salutary beverage, an excellent lithontriptick, and a valuable and efficacious antacid, relieving the distressing symptoms in dyspepsia. It has proved extremely useful in appeasing vomiting in pregnant women, and in all cases of vomiting from irritation of the stomach. It should be taken liberally.

PHOSPHAS SODÆ. *Phosphate of Soda.*

Take of

Bones burnt to whiteness, and powdered, ten pounds,
Sulphurick acid, six pounds,
Water, nine pounds.

Mix the powder with the sulphurick acid in an earthen vessel; then add the water and mix again. Then place the vessel in a vapour bath, and digest for three days; after which dilute the mass with nine pounds more of boiling water, and strain the liquor through a strong linen cloth, pouring over it boiling water, in small quantities at a time, until the whole acid be washed out.

Set by the strained liquor, that the impurities may subside, decant the clear solution, and evaporate it to nine pounds. To this liquor, poured from the impurities, and heated in an earthen vessel, add carbonate of soda, dissolved in warm water, until the effervescence cease. Filter the neutralized liquor, and set it aside to crystallize. To the liquor that remains, after the crystals are taken out, add a little carbonate of soda, if necessary, so as to saturate exactly the phosphorick acid, and dispose the liquor by evaporation to form crystals as long as these can be

produced. Lastly, the crystals are to kept in a well closed vessel.

The white residuum of burnt bones consists chiefly of phosphate of lime. The sulphurick acid decomposes it, by combining with the lime; the phosphorick acid, which is disengaged, dissolves, however, a portion of undecomposed phosphate of lime, forming a soluble compound. When carbonate of soda is added to the acidulous liquor, obtained by washing the materials, the soda combines with the free phosphorick acid; the neutral phosphate of lime, which was combined with that acid, is precipitated, and the phosphate of soda crystallizes on evaporation of the strained liquor. Its crystals are rhomboidal, efflorescent, and require for solution only four parts of cold water. They consist, according to Thernard, of nineteen of soda, fifteen of acid, and sixty-six of water. Its taste is purely saline, without any bitterness.

Phosphate of soda was introduced into the practice of physick by the ingenious Dr. Pearson, of London. It possesses the same medical qualities as the sulphate of soda, and the tartrite of potass and soda, being an excellent purge in the quantity of an ounce or ten drachms; and has the peculiar advantage over these two salts in being much less nauseous than they are. Its taste is extremely similar to that of common salt; and when given in a bason of water gruel, or veal broth without salt, it is scarcely perceptible by the palate, and consequently is well adapted for patients whose stomachs are delicate, and who have an antipathy against the other salts.

Sulphas Sodæ. *Sulphate of Soda.* Glauber's Salt.

Dissolve the acidulous salt which remains after the distillation of muriatick acid, in water; and having mixed chalk with it to remove the superfluous acid, set it aside until the sediment subside; then decant the liquor, strain it through paper, and evaporate it so that it may crystallize.

In the decomposition of muriate of soda by sulphurick acid, to prepare muriatick acid, more sulphurick acid is used than is barely sufficient; and hence the necessity of saturating this excess by the addition of chalk or carbonate of lime. The neutral sulphate of soda crystallizes in hexhædral prisms; they are efflorescent and soluble in rather less than three parts of cold water. Their taste is

at first salt, and afterwards disagreeably bitter. They consist, when dried, of fifty-six parts of sulphurick acid, and forty-four of soda.

Taken from half an ounce to an ounce, or more, it proves a mild and useful purgative; and in smaller doses largely diluted, a serviceable aperient and diuretick. It is commonly given in solution; but it may also be given in powder, after it has effloresced. In this form the dose must be reduced to one half.

The very disagreeable taste of cathartick salts may be in a great measure destroyed by dissolving them in hot lemonade, or by adding to the solution a little of the vegetable acid.

At the salt works in the county of Barnstable, Glauber's salt is prepared to great advantage from the bittern that remains after the crystallization of common salt. This bitter liquor is preserved in the vats; and during the cold in winter the salt is found collected in fine crystals at the bottom. This is purified by moderately boiling in fresh water, and the salt is again crystallized in large shallow vessels. The sulphate of soda prepared at these works is equal in quality to any that is imported, and may be made abundant enough for the whole home market, and the West India Islands. It has been sold at the low price of three dollars per hundred weight; and has been exported to the East and West Indies, where it has come to a profitable market.

Like European salts, it is apt to effloresce, but if secluded from the air and light, for twelve or eighteen months, it becomes hard and permanent.

Tartris Potassæ et Sodæ. *Tartrite of Potass and Soda.* Rochelle Salt.

It is prepared from the carbonate of soda and supertartrite of potass, in the same manner as the tartrite of potass.

The excess of tartarous acid in the acidulous tartrite of potass, being saturated in this preparation with soda, a triple salt is formed. It crystallizes in rhomboidal prisms. Under the name of *Rochelle salt*, it has been employed as a cathartick, in a dose of one ounce; and is often preferred, as being less disagreeable than the greater number of the saline catharticks. It consists of

fifty-four parts of tartrite of potass, and forty-six of tartrite of soda.

AQUA AMMONIÆ. *Water of Ammonia.* Water of Caustick Ammonia.

Take of

Muriate of ammonia, one pound,
Lime, fresh burnt, one pound and a half,
Distilled water, one pound,
Water, nine ounces.

Pour the water on the powdered lime contained in an iron or earthen vessel, which is then to be covered up till the lime fall to powder. Then mix the muriate, previously ground into very fine powder, thoroughly with the lime, by triturating them together in a mortar, and immediately put the mixture into a retort of bottle glass. Put the retort in a sand bath, and connect with it a Woulfe's apparatus. In the first and smallest bottle, furnished with a tube of safety, put two ounces of the distilled water, and in the second the rest of the distilled water.

The fire is now to be kindled, and gradually increased, until the bottom of the sand pot become red. Mix the fluid contained in each of the bottles, and preserve it in small phials accurately closed.

The theory of this process is precisely the same with that directed for the preparation of the lixivium causticum. The lime attracts the muriatick acid of the muriate of ammonia, and the ammonia, or volatile salt, is disengaged, and arises in a liquid form. By itself it is incondensable, but it combines with the watery vapour, and forms an aqueous solution.

When water is perfectly saturated with ammonia, one hundred grains are found to combine with thirty-four; but, in the usual mode of preparing this solution, this perfect saturation is never effected. The solution has a strong pungent smell, a very acrimonious taste, and inflames the skin. It is used in medicine as a powerful stimulant and diaphoretick internally, in a dose of twenty drops largely diluted. Externally, it is applied to the skin as a rubefacient, and in the form of gas to the nostrils, and to the eyes as a stimulant, in cases of torpor, paralysis, rheumatism, syncope, hysteria, and chronick ophthalmia.

ALCOHOL AMMONIATUM. *Ammoniated Alcohol;* or Spirit of Ammonia.

Take of
Alcohol, thirty-two ounces,
Lime, fresh burnt, twelve ounces,
Muriate of ammonia, eight ounces,
Water, eight ounces.

From these ingredients, ammoniated alcohol is prepared, in exactly the same manner, as the water of ammonia.

This compound used formerly to be prepared by decomposing the muriate of ammonia by sub-carbonate of potash. The result of it was, that as carbonate of ammonia is not soluble in alcohol, either the alcohol was impregnated with the portion of ammonia only disengaged by the operation of the excess of alkali in the sub-carbonate on the muriate of ammonia, or that the distillation was carried so far, as to bring over with the alcohol a quantity of water sufficient to dissolve the carbonate of ammonia which had been produced. The Edinburgh college having substituted lime, it disengages the ammonia from the muriate of ammonia altogether in its pure form, and the ammoniacal gas is condensed by the alcohol.

Ammoniated alcohol has the pungent smell, and retains all the powers of ammonia. It is used principally as the menstruum of some vegetables with which ammonia coincides in medicinal operation, and is employed in making the tinctures of guaiacum and valerian.

CARBONAS AMMONIÆ. *Carbonate of Ammonia.* Prepared Ammonia.

Take of
Muriate of ammonia, one pound,
Pure soft carbonate of lime dried, two pounds.

Having triturated them separately, mix them thoroughly, and sublime from a retort into a refrigerated receiver.

This process is an example of double elective attraction. The muriatick acid of the muriate of ammonia combines with the lime of the carbonate of lime, and the carbonick acid of the latter unites with the ammonia of the former. The carbonate of ammonia which is formed,

is sublimed, and is obtained in a white crystalline cake. When the process is carried on in the large way, the sublimation is generally performed from an iron pot, to which the heat is directly applied.

Carbonate of ammonia has the smell and taste of ammonia, but weaker. It is soluble in twice its weight of cold water, and is more soluble as the temperature of the water increases; but when it approaches to a boiling heat, the carbonate is volatilized. It is efflorescent when exposed to the air; and is decomposed by most of the acids.

The volatile alkali and spirit obtained from sal ammoniac are the purest of all the medicines of this kind. They are somewhat more acrimonious than those produced directly from animal substances, which always contain a portion of the oil of the subject, and receive from thence some degree of saponaceous quality.

The volatile salt and spirit prepared from hartshorn and animal bones, are now entirely superseded by those obtained from sal ammoniac. and the process for preparing them is rejected by the Edinburgh college.

Volatile alkaline salts, and their solutions called spirits, agree in many respects, with fixt alkalis and their solutions or leys: as in changing the colours of a blue flower to a green; effervescing, when in their mild state, with, and neutralizing acids; and corroding the fleshy parts so as to act as causticks. By their stimulating smell, they prove serviceable in languors and faintings. Taken internally, they stimulate, greatly promote perspiration, and act particularly on the nervous system. They prove useful in lethargick cases; in hysterical and hypochondriacal disorders, and in the languors, headaches, flatulent colicks, and other symptoms which attend them.

In typhus fever, particularly in the advanced stage, when delirium, subsultus tendinum, and other symptoms of debility are present, the volatile alkali is a remedy to be particularly relied upon; being a powerful stimulant, it raises the vis vitæ, and excites a salutary diaphoresis. Dose from five to ten grains, or the spirit, thirty or forty drops, every hour or two. The following julep is the most convenient form.

℞ Carbon ammo ʒi.
Pul. gum arab. ʒii.
Sacc. alb. ʒi.
Aqu. Font ʒ4. m.
Dose, a table spoonful every hour.

In dyspepsia from debility of the stomach, and in cardialgia during pregnancy, the following formula is excellently adapted to afford relief.

℞ Aqu. ammo. magnes. calcin. aa. ʒi.
Aqu cinnam. ʒii.
Aqu. Font. ʒvi. m.
Dose, a table spoonful p. r. n.

The use of the volatile ammonia has lately been attended with uncommon success in cases of the bite of venomous serpents. Mr. John Williams speaks in the most positive manner of the good effects of the volatile alkali, (spirits of hartshorn or spirit of sal amnoniac) in curing the effects of the bite of venomous snakes in the East Indies. Dr. Wright, who practised many years in Jamaica, directs forty drops of the caustick volatile alkali, as soon as possible after the accident; the dose being repeated every five minutes, while the parts affected are continually washed with the same preparation. A remarkable instance is reported to have occurred at Savannah, in which was experienced the most decided benefit from the use of alkalis in a negro who was bitten by a venomous snake in the foot. The patient was ordered one or two tea spoonfuls of an alkaline solution every fifteen minutes, and the part affected to be kept moist with the solution. The first dose produced immediate good effects, in mitigating the excessive pain and swelling which were making rapid progress up the limb to the body; and a proper repetition of the remedy soon effected a complete cure. The efficacy of this remedy in similar alarming cases, has lately been confirmed, by a publication of Dr. Ramsay, of South Carolina.

Ammonia is well known to possess a like antiseptick quality with other alkaline salts, and is employed for similar purposes.

Aqua Carbonatis Ammoniæ. *Solution of Carbonate of Ammonia.* Water of Ammonia.

Take of
Muriate of ammonia,
Carbonate of potass, each sixteen ounces,
Water, two pounds.

Having mixed the salts and put them into a glass retort, pour the water upon them, and distil to dryness in a sand bath, gradually increasing the heat.

In this preparation of carbonate of ammonia by the humid way, carbonate of lime (chalk) could not be employed to decompose the muriate of ammonia; because the addition of the water prevents the application of the necessary heat, whereas carbonate of potass acts at a moderate temperature. The potass attracts the muriatick acid, the ammonia the carbonick acid. The carbonate of ammonia is volatilized, and dissolved by the watery vapour. The solution is applied to the same medicinal purposes as the concrete ammoniacal carbonate.

A formula is given by the London college for a similar preparation, under the name of liquor carbonatis ammoniæ, obtained by the solution of the solid carbonate in water. Eight ounces of the carbonate of ammonia are dissolved in a pint of distilled water, and the solution is strained through paper.

Aqua Acetitis Ammoniæ. *Water of Acetite of Ammonia.* Spirit of Mindererus.

Take of

Carbonate of ammonia in powder any quantity.

Pour upon it as much distilled acetous acid as may be sufficient to saturate the ammonia exactly.

In this preparation, the acetous acid combines with the ammonia, and the carbonick acid is disengaged with effervescence. The acetite of ammonia remains dissolved in the water of the acetous acid. As the strength of distilled vinegar is not always the same, that of this solution must be variable; an inconvenience not easily obviated.

The following cheap and expeditious method of saturating the common solution obtained by dissolving sal ammoniac (carbonate of ammonia) in vinegar, with fixed air, or *carbonick acid gas*, is too valuable to be omitted.*

Take an ounce of pure sal ammoniac (carbonate of ammonia) and one pint and a half of distilled vinegar; put the latter in a decanter, provided with a close glass stopper; then introduce the salt, previously broken into lumps, but not too small, as by plunging it too suddenly

* Vide Rees's Cycloped. Article Ammonia.

into the liquor, the extrication of the gas would be too quick, and a quantity of it dissipated. Next, the stopper of the bottle should be tied over with a bit of leather, and the whole be left undisturbed. It would be further useful, to add on the top of the bottle some weight or pressure, by which means the combination of the carbonick acid gas with the water will be greatly facilitated. After having stood a few hours, the ammonia will be dissolved, and the carbonick acid gas will be absorbed by the liquor. By this simple process, the water of acetite of ammonia becomes strongly impregnated with fixed air, while it is almost entirely deprived of that disagreeable taste, which is peculiar to this medicine, when prepared in the usual way.

Dr. Lynam, an English practitioner, speaks from experience of the superiour qualities this preparation possesses as a febrifuge; besides the very great advantage, that it tends to keep the bowels open, even under the immediate influence of opiates. It likewise generally agrees with weak and irritable stomachs, which can retain scarcely any other medicine.

Acetite of ammonia, when assisted by a warm regimen, proves an excellent and powerful sudorifick; and as it operates without quickening the circulation or increasing the heat of the body, it is admissible in febrile and inflammatory diseases, in which the use of stimulating sudorificks is attended with danger. Its action may likewise be determined to the kidneys by walking about in a cool air. The common dose is half an ounce, either by itself, or along with other medicines adapted to the same intention.

Pure vinegar is sometimes employed instead of the distilled acetous acid in this preparation.

Hydro-Sulphuretum Ammoniæ. *Hydro Sulphuret of Ammonia.*

Take of

Water of ammonia, four ounces, subject it in a chemical apparatus to a stream of the gas, which arises from

Sulphuret of iron, four ounces,

Muriatick acid, eight ounces, previously diluted with two pounds and a half of water.

Sulphuret of iron is conveniently prepared for this purpose, from

Purified filings of iron, three parts,
Sublimed sulphur, one part,

Mixed and exposed to a moderate degree of heat in a covered crucible, until they unite into a mass.

The sulphureted hydrogen is produced in this process by the muriatick acid disposing the iron to decompose part of the water. The hydrogen disengaged, immediately combines with a portion of the sulphur present, and this compound escaping in the state of gas, is passed through the water of ammonia, with which it unites, and forms a liquor of a dark green colour, and very fœtid odour.

Hydro sulphuret of ammonia acts powerfully on the living system. It induces vertigo, drowsiness, nausea, and vomiting, and lessens the action of the heart and arteries. It therefore seems to be a direct sedative. The principal application of it is in diabetes, with the view of reducing the morbid appetite and increased action of the stomach. It is given in a dose of from five to fifteen drops twice a day.

Murias Barytæ. *Muriate of Baryta.*

Take of

Carbonate of barytes,
Muriatick acid, each one part,
Water, three parts.

Add the carbonate, broken into little bits, to the water and acid, previously mixed. After the effervescence has ceased, digest for an hour, strain the liquor, and set it aside to crystallize. Repeat the evaporation as long as any crystals are formed.

If the carbonate of barytes cannot be procured, the muriate may be prepared in the following manner from the sulphate.

Take of

Sulphate of baryta, two pounds,
Charcoal of wood in powder, four ounces.

Roast the sulphate with fire, that it may be more easily reduced to a very fine powder, with which the charcoal is to be intimately mixed. Put the mixture into a crucible, and having fitted it with a cover, heat it with a strong fire

for six hours. Then triturate the matter well, and throw it into six pounds of water, in an earthen or glass vessel, and mix them by agitation, preventing as much as possible the access of the air.

Let the vessel stand in a vapour bath until the part not dissolved shall subside, then pour off the liquor; on the undissolved part pour four pounds more of boiling water, which, after agitation and deposition, are to be added to the former liquor. Into the liquor while still warm, or if it shall have cooled, again heated, drop muriatick acid as long as it excites any effervescence. Then strain it and evaporate it so as to crystallize.

Sulphate of barytes may be decomposed by carbonate of potass by double affinity, and perhaps this is the least troublesome process; but, when done with the view to the medicinal application of the barytes, it has been supposed defective, as it does not separate the metallick substances with which the native sulphate is so frequently intermixed. The process of decomposing it, therefore, by charcoal, has been deemed preferable. The carbonaceous matter attracts the oxygen of the sulphurick acid; the sulphur remains united with the barytes. This sulphuret of barytes, as well as a portion of hydro-sulphuret formed during the solution, are soluble in water; on dropping in muriatick acid, it combines with the barytes, the sulphur is precipitated, and the sulphureted hydrogen disengaged. By straining and evaporating the liquor, the muriate of barytes is obtained crystallized. It is used under the form of solution, for which also the following formula is given.

Solutio Muriatis Barytæ. *Solution of Muriate of Baryta.*

Take of
Muriate of baryta, one part,
Distilled water, three parts,
Dissolve.

The saturated solution of muriate of barytes was introduced by Dr. Crawford, as a remedy in scrofula, and it has since been used in various forms of hectick fever. Its effects are to improve the appetite and general strength; sometimes it occasions diaphoresis or diuresis. Its dose is five drops, gradually increased to twenty or more. In too large a dose it occasions sickness, vertigo, tremours,

and insensibility. The solution is also used externally as a stimulating and gentle escharotick application in cutaneous diseases, fungous ulcers, and specks upon the cornea.

Aqua Calcis. *Lime Water.*

Take of

Lime recently burnt, half a pound.

Put it into an earthen vessel, and sprinkle on it four ounces of water, keeping the vessel shut, while the lime grows hot, and falls into powder. Then pour on it twelve pounds of water, and mix the lime thoroughly with the water, by agitation. After the lime has subsided, repeat the agitation; and let this be done about ten times, always keeping the vessel shut, that the free access of the air may be prevented. Lastly, let the water be filtered through paper, placed in a funnel, with glass rods interposed between them, that the water may pass as quickly as possible.

It must be kept in very close bottles.

The caution to exclude the air in this process, arises from the supposition that the lime would combine rapidly with the carbonick acid of the atmosphere. After the solution is strained, it is at least necessary, that it should be kept in vessels well stopped. Lime is not more soluble in hot water, than in cold; therefore it is unnecessary to use boiling water. Only a very small quantity of lime is dissolved; about two grains to the ounce.

Lime water is transparent and colourless. It has an austere, acrid taste, and affects vegetable colours as the alkalis do. When applied to the living fibre, lime water corrugates, and shortens it; it therefore possesses astringent powers. It is also a powerful antacid; or, at least, it combines with, and neutralizes acids when it comes in contact with them. It also dissolves mucus, and kills internal worms. From possessing these properties, it is used in medicine, in diseases supposed to arise from laxity or debility of the solids, as diarrhœa, diabetes, leucorrhœa, scrofula, and scurvy; in affections of the stomach, accompanied with acidity and flatulence, when the intestines are loaded with mucus; and in worms. Lime water is scarcely capable of dissolving, even out of the body, any of the substances of which urinary calculi consist; it has therefore no pretensions to the character of a li-

thontriptick. It has been also recommended in crusta lactea, cancer, and chronick cutaneous diseases. Externally it is applied to ill conditioned ulcers, gangrenous sores, as a wash in tinea capitis and psora; and as an injection in gonorrhœa, fistulas, and ulcers of the bladder. When taken internally, its taste is said to be best covered by luke warm milk. Its dose is commonly from two to four ounces, frequently repeated; but when long continued, it weakens the organs of digestion.

Lime water is an excellent remedy for a broken winded horse.

Carbonas Calcis Præparatus. *Prepared Carbonate of Lime.*

Carbonate of lime, whether the variety, commonly called chalk, or that called crab's eyes and crab's stones, after having been triturated to powder in an iron mortar, and levigated on a porphyry stone, with a little water, is to be put into a large vessel, and water to be poured upon it; which, after agitating the vessel repeatedly, is to be again poured off, while loaded with fine powder. On allowing the water to settle, a subtile powder will subside, which is to be dried.

The coarse powder which the water could not suspend, may be levigated again, and treated in the same manner.

Carbonate of lime, formerly prepared chalk, is commonly called an absorbent earth. It certainly is an antacid, that is, it combines with and neutralizes most acids, while its carbonick acid is expelled in the form of gas. It is therefore exhibited in affections of the stomach, accompanied with acidity, especially when at the same time there is a tendency to diarrhœa. The fear of its forming concretions in the bowels is probably imaginary; for it is not warranted either by theory or experience.

Applied externally, carbonate of lime may be considered as an absorbent in another point of view; for its beneficial action on burns and ulcers, probably arises entirely from its imbibing the moisture or ichorous matter, as a sponge would do, and thus preventing it from acting on the abraded surfaces, and excoriating the neighbouring parts.

Red coral, (corallium rubrum) is ordered to be prepared in the same manner, in the London pharmacopœia; but, as it has no qualities but those of carbonate of lime,

there is no necessity for retaining it in the lists of the materia medica.

Solutio Muriatis Calcis. *Solution of Muriate of Lime.*

Take of

Hard carbonate of lime, that is, white marble, broken into pieces, nine ounces,
Muriatick acid, sixteen ounces,
Water, eight ounces.

Mix the acid with the water, and gradually add the pieces of carbonate of lime. When the effervescence has ceased, digest them for an hour; pour off the liquor and evaporate it to dryness. Dissolve the residuum in its weight and a half of water; and, lastly, filter the solution.

The muriatick acid obviously combines with the lime, and disengages the carbonick acid. Its taste is pungent, bitter and disagreeable. It is one of the most deliquescent salts that we know, and is soluble in water; that fluid seems capable of dissolving twice its weight, or at least forms with it a viscid liquid.

It was first proposed as a medicine by Fourcroy, in scrofulous and glandular diseases, and has been lately extravagantly extolled by Dr. Beddoes, in the same affections. A drachm, diluted with an ounce of water, he considers as a medium dose. In an over dose, it has produced qualms and sickness; and three drachms and a half killed a dog, whose stomach, upon dissection, had its villous coat bloodshot, and in many parts almost thick, and converted into a gelatinous slime.

The solution of muriate of lime, has been strongly recommended as a tonick, similar and not inferiour to the muriate of barytes.

Phosphas Calcis Impurus. *Impure Phosphate of Lime.*

Burn pieces of hartshorn till they become perfectly white; then reduce them to a very fine powder.

In the burning of hartshorn, a strong fire, and the free admission of air are necessary. The potter's furnace was formerly directed for the sake of convenience, but any common furnace or stove will do. If the pieces of horn be laid on some lighted charcoal, spread on the bottom of the grate, they will be burnt to a whiteness, still retaining their original form.

Burnt hartshorn, from its white earthy appearance, was formerly considered as an absorbent earth. But since it has been accurately analyzed, that idea has been given up, and its use has been suggested as a remedy in the rickets, a disease, in which the deficiency of the natural deposition of phosphate of lime in the bones, seems to be the essential, or at least, most striking symptom. Mr. Bonhomme, therefore, gave it to the extent of half a scruple, mixed with phosphate of soda, in several cases, with apparent success. Whatever objections may be made to his theory, the practice certainly deserves a trial.

CARBONAS MAGNESIÆ. *Carbonate of Magnesia.* Magnesia Alba.

Take of
Sulphate of magnesia,
Carbonate of potass, equal weights.

Dissolve them separately in double their quantity of warm water, and let the liquors be strained or otherwise freed from the feces; then mix them and instantly add eight times their quantity of warm water. Let the liquor boil for a little on the fire, stirring it at the same time; then let it rest till the heat be somewhat diminished; after which strain it through linen; the carbonate of magnesia will remain upon the cloth; and it is to be washed with pure water till it become altogether void of saline taste.

In this process there is a mutual decomposition of the two salts employed. The potass unites itself to the sulphurick acid, while the carbonick acid combines with the magnesia.

The large quantity of water used, is necessary for the solution of the sulphate of potass formed; and the boiling is indispensably necessary for the expulsion of a portion of the carbonick acid, which retains a part of the magnesia in solution.

Sulphate of potass may be obtained from the liquor which passes through the filter, by evaporation. This is not pure, however, but mixed with undecomposed carbonate of potass: for one hundred parts of crystallized carbonate of potass are sufficient for the decomposition of one hundred and twenty-five parts of sulphate of magnesia; and as the carbonate of potass of commerce contains

a larger proportion of alkali than the crystallized carbonate, a still less proportion should be used. From these quantities, about forty-five parts of carbonate of magnesia are obtained. Boiling the liquor gives the carbonate of magnesia a smoothness, which it has not when this precaution is not observed.

The ablutions should be made with pure water; for nicer purposes, distilled water may be used; and soft water is in every case necessary. Hard water for this process, is peculiarly inadmissible, as the principle of water's giving the property called *hardness*, is generally owing to a salt of lime, which decomposes the carbonate of magnesia by compound affinity, giving rise to carbonate of lime, while the magnesia unites itself to the acid of the calcareous salt, by which the quantity of the carbonate is not only lessened, but is rendered impure by the admixture of the carbonate of lime. Another source of impurity, is the silica which the sub-carbonate of potass generally contains. It is most easily got rid of, by exposing the alkaline solution to the air for several days, before it is used. In proportion as it becomes saturated with the carbonick acid, the silica is precipitated and may be separated by filtration.

In manufactories where the magnesia is calcined, advantage may be taken of this circumstance to deprive the solution of sub-carbonate of potass, of the silex which it contains, by adapting to the calcining vessels, tubes for the purpose of conveying the carbonick acid gas, which is disengaged in this process, into a covered vessel containing this solution. The absorption of the gas will be facilitated by agitation, by means of dashers or otherwise.

Carbonate of magnesia, however, is generally prepared on a large scale from the bittern, or liquor remaining after the crystallization of the muriate of soda, from sea water, which is principally a solution of muriate of magnesia: and there are some niceties of manipulation requisite to give it the lightness and smoothness, which are marks of its goodness.

The carbonate of magnesia is a very light, white, opaque substance, without smell or taste, effervescing with acids. It is not, however, saturated with carbonick acid. By decomposing sulphate of magnesia by an alkaline carbonate, without the application of heat, carbonate of magnesia is gradually deposited in transparent, brilliant crys-

tals, and soluble in about four hundred and eighty times its weight of water. The crystallized carbonate of magnesia consists of fifty acid, twenty-five magnesia, and twenty-five water; the sub-carbonate consists of forty-eight acid, forty magnesia, and twelve water; and the carbonate of commerce of thirty-four acid, forty-five magnesia, and twenty-one water.

Carbonate of magnesia is principally given to correct acidity of the stomach, and in these cases to act as a purgative; for solutions of magnesia in all acids are bitter and purgative; whilst those of the other earths, are more or less austere and astringent. A large dose of magnesia, if the stomach contain no acid to dissolve it, neither purges, nor produces any sensible effect; a moderate one, if an acid be lodged there, or if acid liquors be taken after it, procures several stools; whereas, the common absorbents, under the same circumstances, instead of loosening, bind the belly.

When the carbonate of magnesia meets with an acid in the stomach, there is extricated a considerable quantity of carbonick acid gas, which sometimes causes uneasy distention of the stomach, and the symptoms of flatulence. In such cases, therefore, magnesia is preferable to its carbonate; but on other occasions, good effects arise from the action of the gas evolved, as in nausea and vomiting. It is is given as an antacid, in a dose of from a scruple to a drachm.

Some attempts have been made by the manufacturers of common salt, at Cape Cod, to prepare carbonate of magnesia from the bittern, which is well known to hold a quantity of the muriate of magnesia in solution, and could the artists acquire the necessary practical skill, this article might be procured at those works in a state of purity, and to an extent adequate to every demand.

It affords great satisfaction to announce that the manufacture of this article on an extensive scale has been commenced in this state by Mr. William Dunn, apothecary and chemist, of Boston. His apparatus is connected with an extensive salt-work. He calculates to make thirty thousand pounds a year, sufficient to supply the United States and any other demand which may be made. From each gallon of bittern about five or six ounces of magnesia is obtained. When first formed it is very pure, but by exposure to the air it attracts carbonick acid, and has then all the appearance of the carbonate of magnesia of

the shops. Some specimens of it have been examined, and pronounced equally as pure as that imported. Connected with the apparatus, kettles are prepared for burning the carbonate to form the pure magnesian earth.

MAGNESIA. *Magnesia.* Calcined Magnesia.

Let carbonate of magnesia, put into a crucible, be kept in a red heat for two hours; then put it up in close stopped glass vessels.

By this process the carbonate of magnesia is freed from its acid and water; and, according to the late Dr. Black's experiment, loses about seven twelfths of its weight. A kind of opaque, foggy vapour is observed to escape during the calcination, which is nothing else than a quantity of fine particles of magnesia, buoyed off with a stream of the disengaged gas. About the end of the operation, the magnesia exhibits a kind of luminous, or phosphorescent property, which may be considered as a pretty exact criterion of its being deprived of its acid.

It is to be kept in close vessels, because it attracts, though slowly, the carbonick acid of the atmosphere.

In medicine, it is used for the same general purposes as the carbonate. In certain affections of the stomach, accompanied with much flatulence, magnesia is preferable, both because it contains more magnesia in a given bulk, and, being deprived of its acid, it neutralizes the acid of the stomach, without any extrication of gas, which is often a troublesome consequence when carbonate of magnesia is employed in these complaints.

SUPER-SULPHAS ALUMINÆ ET POTASSÆ EXSICCATUS. *Dried Super-Sulphate of Alumina and Potass.* Burnt Alum.

Melt super-sulphate of alumina and potass in an earthen or iron vessel, and keep it over the fire until it cease to boil. By this process the alum loses its water of crystallization, and becomes more active as an escharotick, for which purpose this preparation is used. Unless for external use as a dry powder, the virtues of alum are not improved by exposure to fire. When burnt it is a mild caustick, and is a principal ingredient in most styptick powders; and as a gentle escharotick it is applied to fungous ulcers.

CHAPTER III.

METALLINE PREPARATIONS.

The following metals are employed in medical practice: Silver, Quicksilver, Copper, Iron, Tin, Lead, Zinc, Antimony, Arsenick, Bismuth, and Gold.

It has already been observed, that metals, in their pure state, do not appear to exert any action on the living system; their combinations only possess medicinal virtues.

The oxidation of metals, and the combination of their oxides with acids, are the chemical changes which communicate to them activity. In general they are more active, in proportion as they are more highly oxidated, and are still more so when combined with acids. Oxygen is not, however, to be regarded, according to a modern hypothesis, as the source of their activity: each metal possesses powers, which, though increased or diminished according to the degree of oxidation, are peculiar to itself, and remain in all its preparations.

ANTIMONY.

Sulphuretum Antimonii Præparatum. *Prepared Sulphuret of Antimony.*

Sulphuret of antimony is prepared in the same manner as carbonate of lime. [See page 459.]

Oxidum Antimonii cum Sulphure, per Nitratem Potassæ. *Oxide of Antimony, with Sulphur, by Nitrate of Potass.* Crocus of Antimony.

Take of
Sulphuret of antimony,
Nitrate of potass, equal weights.

After they are separately powdered and well mixed, let them be injected into a red hot crucible; when the deflagration is over, separate the reddish metallick matter from the whitish crust; powder it, and edulcorate it by repeated washings with hot water, till the water come off insipid.

During the deflagration, the nitrick acid of the nitrate of potass is decomposed; its oxygen is attracted, partly by the sulphur, and partly by the antimony. The sulphurous acid, which is the principal product of the oxygenation of the sulphur, is in part dissipated, and in part combined with the potass, and forms the white crust which is directed to be removed. By the union of another portion of the oxygen with the antimony, a brown or reddish oxide is formed. It appears also, that part of the sulphuret of antimony escapes decomposition or oxygenation, and unites with the oxide. The preparation, therefore, is an imperfect oxide of antimony.

As an antimonial, this preparation is so uncertain in its operation, that it is never prescribed; it is used in making some of the other preparations of this metal.

OXIDUM ANTIMONII, CUM SULPHURE, VITRIFICATUM. *Vitrified Oxide of Antimony with Sulphur.* Glass of Antimony.

Strew sulphuret of antimony beat into a coarse powder like sand, upon a shallow unglazed earthen vessel, and apply a gentle fire underneath, that the sulphuret may be heated slowly; keeping it at the same time continually stirring, to prevent it from running into lumps. White vapours of sulphurous smell will arise from it. When they cease with the degree of heat first applied, increase the fire a little, so that the vapours may again arise; go on in the same manner, till the powder, when brought to a red heat, exhale no more vapours. Melt this powder in a crucible with an intense heat, till it assume the appearance of melted glass; then pour it out on a heated brass plate.

In the first stage of this process the greatest part of the sulphur of the sulphuret of antimony is dissipated, and the antimony is imperfectly oxidated. This oxide is then vitrified by the more extensive heat applied. According to Thenard, it contains sixteen of oxygen to the one hundred.

This preparation is violent, and at the same time uncertain in its operation; and is not used, but in preparing some of the other antimonials.

Oxidum Antimonii Vitrificatum, cum Cera. *Vitrified Oxide of Antimony with Wax.* Cerated glass of Antimony.

Take of

Yellow wax, one part,
Vitrified oxide of antimony with sulphur, eight parts.

Melt the wax in an iron vessel, and throw into it the powdered oxide; roast the mixture over a gentle fire for a quarter of an hour, continually stirring it; then pour it out, and when cold, grind it into powder.

The glass melts in the wax with a very gentle heat. After it has been about twenty minutes on the fire, it begins to change its colour, and in ten more, comes near to that of Scottish snuff, which is a mark of its being sufficiently prepared; the mixture loses about one ninth of its weight in the process.

The cerated glass of antimony was for some time much esteemed in dysenteries. The dose is from two or three grains, to twelve, or more, according to the age and strength of the patient. In its operation, it is both emetick and cathartick; though it has sometimes effected a cure without occasioning any evacuation or sickness. It is now, however, much less used than formerly. Combined with calomel it is an active and valuable remedy.

Sulphuretum Antimonii Præcipitatum. *Precipitated Sulphuret of Antimony.* Golden Sulphur of Antimony.

Take of

Solution of potass, four pounds,
Water, three pounds,
Prepared sulphuret of antimony, two pounds.

Boil them in a covered iron pot, over a slow fire for three hours, adding more water if necessary, and frequently stirring the mixture with an iron spatula; strain the liquor while warm through a double cloth, and add to it when filtered, as much diluted sulphurick acid as is necessary to precipitate the sulphuret, which must be well washed with warm water.

When the liquor, obtained by boiling the solution of potass on the sulphuret of antimony, is strained, and al-

lowed to cool, before the sulphurick acid is added, it deposits a red coloured powder, which has been known by the name of *kermes mineral*, and has been much esteemed in Europe, as an active preparation. When the sulphurick acid is added, it unites with the potass, and the antimonial oxide, combined with parts of the sulphureted hydrogen and sulphur, is precipitated in the form of a light or orange coloured powder, called *sulphur auratum antimonii.*

In its action on the body, the sulphuret of antimony coincides with the kermes mineral: but on account of the larger proportion of sulphur, it must be given in somewhat larger doses; the former not exceeding a grain, or a grain and a half; the latter to the extent of five or six grains. They have been employed principally in diaphoreticks and sudorificks, but are always uncertain in their operation.

A composition of equal parts of sulphur auratum antimonii and mercurius dulcis, has been found a powerful, yet safe alterative in cutaneous disorders; and has completed a cure, after salivation had failed. In venereal cases, likewise, this medicine has produced excellent effects. [See Pilulæ Plummeri.]

Oxidum Antimonii cum Phosphate Calcis. *Oxide of Antimony with Phosphate of Lime.* Antimonial Powder.

Take of
Sulphuret of antimony in coarse powder,
Shavings of hartshorn, equal weights.

Mix, and put them into a wide red hot iron pot, and stir the mixture constantly, until it be burnt into a matter of a gray colour, which is then to be removed from the fire, ground into powder, and put into a coated crucible. Lute to this crucible another inverted over it, and perforated in the bottom with a small hole, and apply the fire, which is to be raised gradually to a white heat, and kept in that increased state for two hours. Lastly, grind the matter, when cold, into a very fine powder.

This has been introduced into the pharmacopœias, as affording a preparation, similar to the celebrated empirical remedy, *James's powder.* For the process, we are indebted to Dr. Pearson, of London. By analysis, he found the genuine powder of Dr. James, to consist of

forty-three parts of phosphate of lime, and fifty-seven of an oxide of antimony, part of which was vitrified; and by the above formula he was enabled to prepare a powder, similar to it in qualities and chemical composition.

The theory of the process is sufficiently obvious. During the first stage, the animal matter of the bone is decomposed and burnt out; the sulphur of the sulphuret of antimony is expelled, and the metal is imperfectly oxidated. In the second, the metal is more completely oxidated, partially vitrified, and perhaps brought in combination with the phosphate of lime, which is the residuum of the bones. From Mr. Chenevix's experiments, it appears, that, in this preparation, more of the oxide of antimony is vitrified, than in the genuine James's powder.

The oxide of antimony with phosphate of lime, (James's powder,) is one of the best antimonials we possess. It has been long celebrated as a remedy in febrile affections. It acts as a very general evacuant, occasioning sweat, purging, and frequently vomiting; and, by this general action, appears to arrest the progress of the disease. Its dose is five or six grains, repeated every six hours, until its effects are obtained. It is better adapted to fevers of an inflammatory nature, than to those of the typhoid kind. It has been affirmed, that the preparation obtained by the above process, is neither so certain, nor so powerful in its operation, as the powder of James; eight grains of the former, being not more than equal to six of the latter. The difference, if it exist, may be owing to some peculiarity in the process, by which, perhaps, a difference of oxidation, or of vitrification of the oxide may be occasioned; or according to the opinion of Dr. Fordyce, to the intermixture of a portion of tartarized antimony in the empirical preparation.

Murias Antimonii. *Muriate of Antimony.* Butter of Antimony.

Take of

Oxide of antimony with sulphur, by nitrate of potass,
Sulphurick acid, each one pound,
Dried muriate of soda, two pounds.

Pour the sulphurick acid into a retort, gradually adding the muriate of soda and oxide of antimony previously

mixed. Then perform the distillation in a sand bath. Expose the distilled matter for several days to the air, that it may deliquesce, and then pour the liquid part from the feces.

In this mode of forming muriate of antimony, the muriate of soda is decomposed by the sulphurick acid combining with the soda; the muriatick acid disengaged, unites with the oxide of antimony, and the compound is volatilized. It is at first of a soft consistence, from which it takes the name of butter of antimony, but soon attracts a sufficient quantity of humidity, to render it fluid. If water be poured upon it, it is decomposed, and a sub-muriate of antimony is precipitated.

This preparation is unfit for internal use; externally, it has sometimes been used as a caustick. Decomposed by potass, it affords an oxide, which has been used in preparing the tartrite of antimony.

TARTRIS ANTIMONII. *Tartrite of Antimony.* Emetick Tartar.

Take of

Oxide of antimony with sulphur, by nitrate of potass, three parts,
Super-tartrite of potass, four parts,
Distilled water, thirty-two parts.

Boil in a glass vessel for a quarter of an hour, strain through paper, and set aside the strained liquor to crystallize.

The excess of tartarous acid in the super-tartrite of potass, is capable of combining with a number of the metallick oxides, and forming ternary compounds. With oxide of antimony, when not too highly oxidated, it unites with facility, forming a combination of this kind, which constitutes the present preparation. As the tartarous acid is saturated, partly by potass, and partly by oxide of antimony, it is not a pure tartrite of antimony, but a tartrite of antimony and potass. According to the analysis of it by Thenard, it consists of thirty-eight parts of oxide of antimony, thirty-four of tartarous acid, sixteen of potass, and eight of water.

As this is the most important of the antimonial preparations, the processes for obtaining it have been often varied, principally, in the selection of the oxide of antimony employed.

The vitrified oxide is, perhaps, the most unexceptionable ; it contains, indeed, a portion of siliceous earth, which accompanies the oxide of antimony in its combination with the tartarous acid ; and, when the liquor is considerably evaporated, gives to it a gelatinous consistence : but, before this happens, the greater part of the tartrite of antimony and potass may be procured by crystallization ; or, according to Vauquelin's method, the solution may be directly evaporated to dryness, and, on again dissolving the saline matter in water, the silex remains undissolved. The solubility of tartar emetick has been variously stated, and appears to vary, according to the quantity of antimonial oxide contained in it, from proper preparations.

According to Dr. Saunders, one ounce of water at 60°, dissolves fifty-two grains of the fully saturated salt, while of that generally met with, it dissolves from thirty-two to thirty-five. This affords even a mode of judging of the strength of this preparation. It is very susceptible of decomposition, suffering it not only from alkalis, earths, acids, and a number of neutral salts, but even from vegetable infusions and decoctions ; the vegetable matter, attracting apparently part of the oxygen of the oxide. If kept dissolved in water, it is also decomposed, from the spontaneous decomposition of the tartarous acid. Of all the preparations of antimony, this is the most certain in its operation ; and, it is almost indispensable in the practice of medicine. In doses from one to eight grains, it operates as an emetick, and sometimes as a cathartick. In smaller doses, it excites nausea, and proves a powerful diaphoretick and expectorant. As an emetick, it is chiefly given in the beginning of fevers. and febrile diseases, in chin cough ; and, in general, whenever we wish to evacuate the stomach quickly. When great debility is present, and in the advanced stages of typhoid fever, its use is improper, and even sometimes fatal. As a diaphoretick, it is given in small doses, of from an eighth to a quarter of a grain ; as an expectorant, in doses still smaller.

The only proper form for exhibiting it. is in solution ; and as the intensity of its action on the body, is liable to variation. from difference in its own strength, and in the constitution of the patient, it should almost always be given in divided doses, at short intervals, if we wish to excite vomiting ; and at longer intervals, if we only wish it to act on the skin and lungs.

In obstinate constipation attending bilious colick, emetick tartar is given from four or five to twenty grains by way of enema with the happiest effects.

Tartrite of antimony in solution is much employed in Europe for increasing the gastrick secretions, and maintaining for a length of time a lax state of the bowels. And it is not unfrequently recommended as a stimulating application to the region of the stomach in angina pectoris, and in chin cough.

Panacea Antimonii. *Panacea Antimony.*

Take of

Antimony, six ounces,
Nitre, two ounces,
Common salt, one ounce and a half,
Charcoal, an ounce.

Reduce them to a fine powder, and put the mixture into a red hot crucible, by half a spoonful at a time, continuing the fire a quarter of an hour after the last injection: then, either pour the matter into a cone, or let it cool in the crucible; which, when cold, must be broken to get it out. In the bottom will be found a quantity of regulus: above this, a compact, liver coloured substance; and on the top, a more spongy mass: this last is to be reduced into powder, edulcorated with water, and dried; when it appears of a fine golden colour.

This preparation is found in a former Edinburgh pharmacopœia, and is supposed to have been the basis of the long celebrated *Lockyer's pills*. Ten grains of the powder, mixed with an ounce of white sugar candy, and made into a mass, with mucilage of gum tragacanth, may be divided into a hundred small pills; of which, one, two, or three, taken at a time, are found to work gently by stool and vomit. The dose should be gradually increased, until the proper effect be produced. Under certain circumstances of the patient, they moderately evacuate the stomach, and in dropsical cases, they have frequently succeeded as one of the most efficacious catharticks. In many cutaneous affections, the use of these pills, when duly persisted in, has been attended with the happiest effects.

SILVER.

NITRAS ARGENTI. *Nitrate of Silver.* Lunar Caustick.

Take of

Purest silver, flatted into plates, and cut in pieces, four ounces,
Diluted nitrous acid, eight ounces,
Distilled water, four ounces.

Dissolve the silver in a phial with a gentle heat, and evaporate the solution to dryness. Then put the mass into a large crucible, and place it on the fire, which should at first be gentle, and afterwards increased by degrees, till the mass flow like oil; then pour it into iron pipes, previously heated and anointed with tallow.—Lastly, let it be kept in a glass vessel well closed.

The silver, in this process, is oxidated and dissolved by the nitrous acid. By the subsequent fusion, part of the acid is expelled; so that this is rather a sub-nitrate, than a nitrate of silver. It is a strong caustick, and possesses the advantage of being easily applied. It is, therefore, the one in most general use, for consuming fungous excrescences, callous edges, warts, strictures in urethra, and the like. It is also employed to destroy the venereal poison in chancres, before it has operated on the system. A weak solution of it may be applied as a stimulus to indolent ulcers, or injected into fistulous sores.

Notwithstanding its causticity, it has been given internally. Boerhaave, Boyle, and others, commend it highly in hydropick cases. The former assures us, that made into pills, with crumb of bread, and a little sugar, and taken on an empty stomach, (some warm water sweetened with honey, being drank immediately after) it purges gently, without griping, and brings away a large quantity of water, almost without the patient's perceiving it; that it kills worms, and cures many ulcerous disorders. He nevertheless cautions against using it too freely, or in too large a dose, and observes, that it always proves corrosive, and weakens the stomach.

It has been more recently employed, and with success, in epilepsy and angina pectoris. The former disease, when not depending on organick derangement, is frequently connected with morbid susceptibility, and which tonicks sometimes remove. The advantage derived from

the administration of nitrate of silver has been established on the testimony of Dr. Sims, Dr. Cappe, Dr. Bostic, and others. The dose is a quarter of a grain of the crystallized nitrate, which may be given three or four times a day. Distilled water must be employed to dissolve it, as spring water would decompose it; and the solution may be made into pills with bread. It sometimes acts as a cathartick, and if it occasion much cathartick effect with griping, or excite nausea, the dose must be diminished. Dr. Cappe has related a case of angina pectoris, the symptoms of which were removed by a similar administration of nitrate of silver. By Dr. Powell, who is said to employ it with singular advantages in most of the cases of neuroses, from two to five grains are given every six hours. Professor Chapman in one case of epilepsy gradually augmented the dose to eighteen grains in the twenty-four hours, without injury, but without curing the disease. These examples, however, are not to be imitated without the greatest caution and attention to the effects.

In several instances of leucorrhœa the nitrate of silver has been employed in doses of one twelfth of a grain three times in a day with complete success.

COPPER.

Ammoniaretum Cupri. *Ammoniaret of Copper.* Ammoniacal Copper.

Take of

Purest sulphate of copper, two parts,
Carbonate of ammonia, three parts.

Rub them carefully together in a glass mortar, until after the effervescence has entirely ceased; they unite in a violet coloured mass, which must be wrapped up in blotting paper, and first dried on a chalk stone, and afterwards by a gentle heat. The product must be kept in a glass phial well closed.

The sulphate of copper is decomposed by the carbonate of ammonia. One portion of ammonia combines with the sulphurick acid, another portion of it unites with the oxide of copper; and the violet coloured mass which is formed, is a mixture of the two resulting compounds: the carbonick acid is disengaged with effervescence.

This preparation has sometimes been serviceable in epilepsies, but, from its frequent want of success, and the disagreeable consequences with which its use is sometimes attended, it has not lately been much prescribed. It is employed by beginning with doses of half a grain twice a day; and increasing them gradually to as much as the stomach will bear. Dr. Cullen sometimes increased the dose to five grains.

Solutio Sulphatis Cupri Composita. *Compound Solution of Sulphate of Copper.* Styptick Water.

Take of
Sulphate of copper,
Super-sulphate of alumina and potass, each three ounces,
Water, two pounds,
Diluted sulphurick acid, an ounce and a half.

Boil the sulphates in the water to dissolve them, and then add the acid to the liquor filtered through paper.

This is merely a combination of powerful astringents. It has been applied topically to check hæmorrhagy, and, largely diluted with water, as a wash in purulent ophthalmia. This preparation, or a similar one made extemporaneously, in doses of fifteen or twenty drops, often repeated, will be found a remedy of superiour efficacy and speedy relief in obstinate menorrhagia.

IRON.

Ferri Limatura Purificata. *Purified Filings of Iron.*

Let a piece of pure iron be filed with a clean file, then place a sieve over the filings, and apply a magnet, so that the filings may be attracted upwards through the sieve.

The iron is in this manner obtained nearly pure, the interposition of the sieve in a great measure preventing particles of other metals, or impurities which are generally mixed with the iron filings, got from the workshops, from being entangled in the cluster which adheres to the magnet. The scales of the oxide of iron, which are to be found at the foot of the blacksmith's anvil, are also to be purified by the application of the magnet. For the magnet will only attract the smaller and purer scales, and will leave those which are larger and less pure.

Oxidum Ferri Nigrum Purificatum. *Purified Black Oxide of Iron.* Purified Iron Scales.

Let the scales of the oxide of iron, which are to be found at the foot of the blacksmith's anvil, be purified by the application of a magnet. For the magnet will attract only the smaller and purer scales, and will leave those which are larger and less pure.

Carbonas Ferri. *Carbonate of Iron.* Rust of Iron.

Moisten purified filings of iron frequently with water, that they may be converted into rust, which is to be ground into an impalpable powder.

During exposure to air and moisture, iron is oxidated, and this oxide is found to be combined with carbonick acid, absorbed, probably, from the atmosphere.

As a chalybeate, it is more active than the pure metal, and more mild than the other saline combinations of iron. Its dose is from ten to twenty grains.

Carbonas Ferri Præcipitatus. *Precipitated Carbonate of Iron.*

Take of

Sulphate of iron, four ounces,
Carbonate of soda, five ounces,
Water, ten pounds.

Dissolve the sulphate in the water, and add the carbonate of soda, previously dissolved, in a sufficient quantity of water, and mix them thoroughly.

Wash the carbonate of iron, which is precipitated, with warm water, and afterwards dry it.

On mixing the solutions of these salts together, there is an immediate mutual decomposition. Sulphate of soda is formed, which remains in solution, and carbonate of iron, which is precipitated of a green colour. The precipitate, when first formed, is the carbonate of black oxide of iron, or contains the iron, in the state of black oxide, the state in which it exists in the green sulphate of iron; but in the process of drying, it absorbs more oxygen, becomes of a red colour, and is converted into the carbonate of red oxide of iron.

The carbonate of iron is an excellent and safe chalybeate. It may be given as a tonick, in doses of from five

to thirty grains; but all chalybeates answer better in small doses, frequently repeated, than in large doses. The formula of Dr. Griffiths, which has been highly celebrated as a chalybeate, is an extemporaneous preparation of this kind.

Aqua Super-Carbonatis Ferri. *Solution of the Super-Carbonate of Iron.*

It is prepared in the same manner as the water of carbonick acid, by suspending in the water half an ounce of iron wire.

This is a very elegant chalybeate. The iron is in a state of black oxide, and is dissolved by means of carbonick acid. It was first prepared by Bergman, in imitation of the natural chalybeate waters, and it forms an excellent substitute for them.

Sulphas Ferri. *Sulphate of Iron.* Salt of Steel.

Take of

Purified filings of iron, six ounces,
Sulphurick acid, eight ounces,
Water, two pounds and a half.

Mix them, and after the effervescence ceases, digest the mixture for some time upon warm sand; then strain the liquor through paper, and after due evaporation, set it at rest to crystallize.

The sulphurick acid, by a disposing affinity, enables the iron to attract the oxygen of the water with rapidity, and unites with the oxide thus formed. This oxide is at the *minimum* of oxidation, and the salt which it forms is named the green sulphate of iron, to distinguish it from the red sulphate, in which the metal is more highly oxidized. This green sulphate is prepared for the various purposes for which it is used in the arts, on a large scale, by exposing the native sulphuret of iron to air and moisture; but it is impure: by the present process, it is obtained in a state of greater purity.

Sulphate of iron is one of the most active preparations of the metal, and is frequently employed in cachectick and chlorotick cases, for exciting the uterine discharges, strengthening the tone of the viscera, and destroying worms. Its medium dose is from three to five grains.

The common green vitriol, or copperas, is sometimes substituted for this preparation; but the former, often containing zinc or copper, is too impure for internal use.

SULPHAS FERRI EXSICCATUS. *Dried Sulphate of Iron.* Calcined Vitriol.

Take of

Sulphate of iron, any quantity.

Expose it to the action of a moderate heat in an unglazed earthen vessel, until it become white and perfectly dry. The heat applied here must not be so great as to decompose the sulphate of iron, but only to deprive it of its water of crystallization.

This is merely the sulphate of iron, freed from its water of crystallization. It was never medicinally employed, and has a place in the pharmacopœia, only from being employed in one or two pharmaceutical preparations.

OXIDUM FERRI RUBRUM. *Red Oxide of Iron.* Colcothar of Vitriol.

Expose dried sulphate of iron to an intense heat, until it be converted into a very red matter.

By an intense heat, sulphate of iron is decomposed; its acid is partly expelled, and in part suffers decomposition. The red oxide is the residuum. It is scarcely medicinally employed, but is used in some pharmaceutical preparations.

MURIAS AMMONIÆ ET FERRI. *Muriate of Ammonia and Iron.* Martial Flowers.

Take of

Red oxide of iron, washed and again dried,
Muriate of ammonia, equal weights.

Mix them thoroughly and sublime.

Oxide of iron decomposes muriate of ammonia, by attracting the muriatick acid, and, in the present process, this decomposition takes place. But, from the proportion of the substances employed, part of the muriate of ammonia escapes decomposition; it is sublimed by the heat applied, and elevates along with it, part of the muriate of iron that had been formed. The process, therefore, is rather an unscientifick mode of obtaining a muriate of

iron : the preparation, too, has been found uncertain in strength, more or less of the muriate of iron being sublimed, according to the heat applied ; and, accordingly, it has now fallen into disuse. It has been found serviceable in hysterical and hypochondriacal cases, and in distempers proceeding from a laxity and weakness of the solids ; as the rickets. From two or three, to ten grains, may be conveniently taken in the form of bolus.

MISTURA FERRI COMPOSITA. *Compound Mixture of Iron.* (Lond. Phar.)

Take of

Myrrh powdered, a drachm,
Sub-carbonate of potass, twenty-five grains,
Rose water, seven ounces and a half,
Sulphate of iron powdered, a scruple,
Spirit of lavender, half an ounce,
Refined sugar, a drachm.

Rub together the myrrh, the sub-carbonate of potass and sugar ; and during the trituration, add gradually, first, the rose water and spirit of nutmeg, and last the sulphate of iron. Pour the mixture immediately into a proper glass bottle, and stop it close.

This, with a few trivial alterations, is the celebrated antihectick mixture of Dr. Griffith, and is now introduced from the London pharmacopœia, for the purpose of giving precise directions for its preparation. As first invented, says Mr. Murray, it was undoubtedly an unchemical mixture, the prescriber not being aware of the changes produced in the active ingredients by their mutual action, but which, in practice, was found possessed of peculiar advantages. The sulphate of iron, it is obvious, is decomposed by the sub-carbonate of potass, the sulphurick acid combining with the potass, while the carbonick acid unites with the oxide of iron. The carbonate of iron which is formed is diffused in the mixture along with the myrrh, and both are probably kept more completely suspended by an excess of alkali. This chalybeate proves much less irritating than the sulphate of iron, producing no unpleasant effect on the stomach, and at the same time it is more active than the common carbonate or rust of iron, in which the iron is at the maximum of oxidation, while, in the present preparation, it is at the minimum, is in a different state of aggregation, and probably combined with a

larger quantity of carbonick acid. To preserve it in this low state of oxidation, it is ordered to be kept in a bottle closely stopped; but as iron has a strong tendency to pass to a more highly oxidated state, and suffers this change very rapidly from the action of the air, it is preferable that the preparation should be always extemporaneously made. Griffith's mixture was employed as a remedy in hectick fever, in chlorosis, and other diseases, in which iron is given as a tonick. The mixture of the London pharmacopœia, which is nearly of the same strength, may be given in the same cases, in a dose of an ounce, once or twice a day. It is employed with the greatest success in those cases of hectick fever which are unattended by any great degree of heat or thirst, and which do not show manifest signs of inflammation. It will in general be found to sit easy on the stomach; but should it disagree, or should hectick fever and flushings prevail to a high degree, the proportion of the ingredients may be changed, or the sulphate of iron altogether omitted.

Phosphas Ferri. *Phosphate of Iron.*

Dissolve four ounces of sulphate of iron, in ten pounds of water; set it by, that the impurities may subside, and decant the clear solution.

In a separate vessel, dissolve four ounces of phosphate of soda, in three pounds of water, and add this solution to the preceding. The phosphate of iron will be precipitated in the form of a blue powder, which must be collected on a filter, well washed with warm water, to free it from the sulphate of soda, which is also formed in the process, and then dried with a moderate heat. This is the process by which Dr. John Williams, of Cambridge, prepares this article.

By a similar process, Dr. Caleb Miller, of Bristol, prepares his phosphate of iron, but which is afterwards oxygenated, (as he terms it) by subjecting the powder to a fall of water in broken showers, by which it is converted to a yellowish colour.

A similar preparation may be obtained by substituting, in the above process, the red sulphate of iron (which is formed by exposing a solution of the green sulphate to the action of the atmosphere for a considerable time,) for the green sulphate. It may also be obtained by exposing the blue phosphate to a considerable degree of heat.

It is not probable that these preparations possess different properties, or produce effects essentially different. There is, however, a difference in point of strength. The yellow phosphate is given in doses of from thirty to sixty grains, three times in a day, while the blue should not exceed in one dose eight or ten grains, as it is apt to produce nausea and vomiting, and other unpleasant effects. These preparations have been administered of late with satisfactory success in diseases of debility and various chronick affections, in which chalybeates in general have long been employed. In amenorrhœa, especially when accompanied with an impaired state of the digestive powers, these preparations have proved of efficacy, undoubtedly equal, if not superiour, to most other preparations of iron. In the New England Med. Journal, vol. 3d and 4th, favourable reports respecting this medicine will be found as a remedy in scrofula, dyspepsia, amenorrhœa, chronick rheumatism, diarrhœa, and obstinate cutaneous eruptions. The phosphate, and the oxy-phosphate of iron, were the favourite remedies with Mr. Carmichael, of Dublin, in cancerous affections; but his account of the successful application is suspected to have been exaggerated.

QUICKSILVER.

HYDRARGYRUS PURIFICATUS. *Purified Quicksilver.*

Take of

Quicksilver, four parts,
Purified filings of iron, one part.

Rub them together, and distil from an iron vessel.

Quicksilver is sometimes adulterated with other metals. To obtain it perfectly pure, is the design of this process. The addition of the iron filings renders the distilled quicksilver more bright and mobile, an effect not perfectly explained, but ascribed to the iron retaining combined with it any foreign metal, or any portion of carbon that might have been contained in the quicksilver.

Acetis Hydrargyri. *Acetite of Quicksilver.*

Take of

Purified quicksilver, three ounces,
Diluted nitrous acid, four ounces and a half, or a little more than may be required for dissolving the quicksilver,
Acetite of potass, three ounces,
Boiling water, eight pounds.

Mix the quicksilver with the diluted nitrous acid, and after the effervescence has ceased, digest if necessary, with a gentle heat, until the quicksilver be entirely dissolved. Then dissolve the acetite of potass in the boiling water, and immediately to this solution, still hot, add the former, and mix them by agitation. Then set the mixture aside to crystallize. Place the crystals in a funnel, and wash them with cold distilled water; and, lastly, dry them with as gentle a heat as possible.

In preparing the acetite of quicksilver, it is important that all the vessels and funnels employed, be of glass.

For making the acetite of mercury, the nitrate is prepared with a very gentle heat; and with excess of acid, that it may be retained in perfect solution, and that there may be no possibility of any admixture of subnitrate with the acetite formed. A larger proportion of acid is used by the Edinburgh college, than by the other colleges; but we believe it to be unnecessary. In mixing the solutions, we must be careful to pour the mercurial solution into the acetite of potass, because by adopting the contrary procedure, subnitate of mercury will be precipitated undecomposed, if any of it be contained in mercurial solution.

For dissolving the acetite of potass, the London and Dublin colleges only use as much water as is capable of retaining the nitrate of potass in solution: the acetite of mercury is therefore precipitated, and is purified by again dissolving it in boiling water, and crystallizing it. This part of the process is simplified by the Edinburgh college, who use as much water for dissolving the acetite of potass, as is capable of retaining, as long as it is hot, the acetite of mercury in solution, and of allowing it to crystallize as it cools. In this way, therefore, it is procured at once sufficiently pure.

The exsiccation of the acetite of mercury, is an operation of great delicacy; for it is so spongy, that it retains the moisture with great obstinacy; and it is decomposed so easily, that heat can scarcely be employed. It is best dried, by compressing it between several folds of bibulous paper.

Acetite of mercury is scarcely soluble in cold water, but dissolves very readily in boiling water.

As an anti-syphilitick remedy, it is very mild in its operation; but its effects are not considered as sufficiently permanent, to warrant its effecting a radical cure; although it was the active ingredient of the celebrated Keyser's pills. Its dose is a grain, night and morning. In solution it has also been recommended externally, to remove freckles and cutaneous eruptions.

MURIAS HYDRARGYRI. *Muriate of Quicksilver.* Corrosive Sublimate.

Take of

Purified quicksilver, two pounds,
Sulphurick acid, two pounds and a half,
Dried muriate of soda, four pounds.

Boil the quicksilver with the sulphurick acid in a glass vessel, placed in a sand bath, until the matter be dried. Mix the matter when cold, in a glass vessel, with the muriate of soda, then sublime in a glass cucurbit, with a heat gradually increased. Lastly, separate the sublimed matter from the scoriæ.

In the first stage of this process, the sulphurick acid oxidizes the mercury, and combines with the oxide; and, by the heat applied, the salt thus formed is that which contains the metal in a high state of oxidizement. This salt, in its dry state, is mixed with muriate of soda, and, by the application of heat, a double decomposition is effected; the soda attracts the sulphurick acid, and the muriatick acid combines with the oxide of mercury. The muriate of mercury being easily volatilized, is separated from the sulphate of soda by sublimation.

According to the analysis of muriate of mercury by Mr. Chenevix, the compound consists of mercury in a high state of oxidation united with muriatick acid; the oxide, which is its basis, he concluded, consists of eighty-five of mercury and fifteen of oxide; and one hundred parts of

the salt are composed of eighty-two of this oxide and eighteen of muriatick acid. Its ultimate principles, therefore, and their proportions are 18 of acid, 12.3 of oxygen, and 69.7 of quicksilver. Zaboada, from a more recent analysis, has inferred, that the oxide does not contain more than ten of oxygen in one hundred parts, and that eighty of this oxide are combined with twenty of acid. According to this, the ultimate principles and their proportions will be twenty of acid, eighty five of oxygen, and 71.5 of quicksilver. The muriate of mercury is soluble in water and in alcohol, has a taste styptick and metallick, and exerts a degree of escharotick power. It turns several vegetable colours to a green; is decomposed by the alkalis and earths, and by a number of compound salts, and likewise by vegetable infusions.

Mercury, says Mr. Murray, oxidated and combined with muriatick acid, forms two very active preparations, differing in the degree of oxidation, and in the proportion of acid with which the oxide is combined. The one has been long known by the name of *corrosive sublimate* of *mercury*, the other by that of *mild sublimate*, or *calomel*. The former is now named muriate of quicksilver by the Edinburgh college, and oxymuriate of quicksilver by the London college; the latter, by both colleges, submuriate of mercury; names not sufficiently distinctive, and chemically incorrect. The old distinguishing epithets are still the least ambiguous, and even as a chemical nomenclature are properly used.

Corrosive muriate of mercury is the most powerful of the mercurial preparations. According to Murray, its dose cannot safely exceed the fourth of a grain, nor can more than one grain be given in twenty-four hours. As an antisyphilitick remedy it acts speedily, and its action is more general on the system, or less determined to particular organs: These advantages have led to its frequent use, especially under the form of various empirical remedies, which have been employed in the treatment of syphilis. They are more than counterbalanced, however, by the occasional violence of its operation, and by the uncertainty which attends it, so that it cannot be relied on in establishing a permanent cure.

In other diseases besides lues venerea, it is occasionally exhibited, particularly in cutaneous affections. Externally, its solution is employed as an escharotick in chancre and venereal ulcers of the mouth; and a very dilute

solution of it has been used as an injection, to excite inflammation in obstinate gleet, and also as a collyrium in venereal ophthalmia, and a lotion in some cutaneous affections. But even externally its use requires some caution.

Corrosive sublimate was highly praised for its antisyphilitick virtues by the celebrated Van Swieten; but in modern medicine there is a diversity of opinion relative to the subject. Mr. Pearson says that it will sometimes cure the primary symptoms of syphilis, especially if it produce considerable soreness of the gums, and the common specifick effects of mercury in the system; but it will often fail, and will not secure the patient from a constitutional affection. It is on some occasions, however, a useful auxiliary to a mercurial course, in quickly bringing the system under the influence of mercury, and in supporting its action after the use of frictions, and is peculiarly efficacious in relieving venereal pains, in healing ulcers of the throat, and in promoting the desquamation of eruptions. On some occasions during the use of this medicine new symptoms will appear, and it will fail of affording the least advantage to the patient from first to last; and on no account does he think it safe to confide in this preparation singly and uncombined, for the cure of any truly venereal symptoms.

In the discussion, however, of this subject by Dr. Frances, as mentioned when speaking of mercury in the materia medica, we find names of great celebrity, who, since the year 1754, have been the advocates for this form of mercury, and who have made the most favourable reports of its antivenereal powers. Among these, Dr. Locher of the Vienna hospital is adduced, as having cured, from the year 1754 to 1762, no less than 4880 persons by this preparation alone, without inducing salivation, or the least painful or dangerous symptoms whatever. But the writer farther substantiates his favourable opinion of corrosive sublimate by the respectable testimony of professor Hosack, who for the last seventeen years has employed it for the removal of lues venerea in its various stages with uniform success. In the course of the extensive private and publick practice of the professor, no disappointment was experienced; not a case occurred in which the cure has not been permanent. By a cautious administration of the medicine, salivation was scarcely ever induced; and those injurious effects upon the stomach and bowels which are so greatly apprehended,

were also avoided. In the spring of the year 1811, the antivenereal powers of corrosive sublimate were again put to the fairest experiment in the New York hospital, by Mr. I. Cheesman, the house surgeon; and complete success was the result of the numerous instances of trial. Since that period the use of this medicine has been more generally adopted and approved. It appears, therefore, from the authority adduced, that of all mercurials, the corrosive sublimate soonest affects the system, and suspends the action of the venereal virus; that it is the most mild, safe, and certain remedy; and that it ought to be preferred in every instance of syphilis. As a proof of its comparative mildness, Dr. F. affirms, that when given to delicate children, or even infants, labouring under some hereditary taint, obstinate eruptive disease, or other symptoms indicating an alterative course, it has never in his practice, or that of professor Hosack, induced pernicious effects, excepting that an over dose will excite some nausea. For these delicate subjects, two grains of the sublimate are dissolved in one ounce of common brandy, of which four drops to a child of one year, and six or eight to one of three years, are given three times a day in a little sweetened water. After its use two or three days, the dose may be a little increased. As an antivenereal remedy in the various stages of syphilis, it is administered either in the form of spirituous solution or of pills; the latter is generally to be preferred. To fifteen grains of the corrosive sublimate add the same quantity of the muriate of ammonia; having well rubbed them together, pour on one drachm of pure water, combine with the mixture a sufficient quantity of the crumb of stale wheat bread to absorb all the fluid, and divide the mass into one hundred and twenty pills. One of these is to be taken every night and morning, though in some aggravated cases another pill may be taken in the middle of the day. Thus a quarter of a grain of this preparation will be taken in twenty-four hours, without any inconvenience, though the same quantity in the form of solution might induce nausea, and some serious derangement of the stomach and bowels. The employment of the medicine ought in general to be continued two or three weeks after the disappearance of the disease, in order to effect with more certainty a radical cure. As auxiliary to the above course, the decoction of guaiacum and sarsaparilla was employed, and attended with

advantage. On some occasions mucilaginous diluents and the use of opium may appear requisite to obviate any irritation excited by an over dose of the medicine.

Ganglions of the tendons may be effectually removed by injecting a solution of corrosive sublimate into an incision made for that purpose.

This active medicine is too frequently resorted to by the most unqualified persons, and taken in a very unwarrantable manner. While writing on this article, application was made by a sea captain for twenty grains of sublimate, and twelve grains of the oxide of arsenick, to be dissolved in one ounce of liquid laudanum! Ten or twelve drops of such compound he had been taking, he said, twice a day, for several weeks, without experiencing any particular effect.

In the contributions of medical knowledge by the late Dr. Beddoes, it appears that Mr. Addington has adopted a mode of effecting a rapid salivation for the cure of gonorrhœa virulenta with the corrosive sublimate dissolved in rectified spirit of wine. He asserts that he has cured hundreds in a very short time in this manner, without the least disagreeable consequence. Three grains of the sublimate are to be dissolved in one ounce of rectified spirit of wine. Half of this mixture is to be taken undiluted at going to bed; it produces a copious salivation for an hour and a half or longer, and the patient spits a quart. Some Glauber's salts are to be taken on the second day after this operation; and on the evening of that day he is to repeat the draught, and the salts on the day but one following. Dr. Darwin has suggested the administration of corrosive sublimate in the same manner, with the design of exciting a rapid salivation, as a remedy in hydrophobia.

In cases of torpor from deficient energy in the extreme vessels, as in typhoid fever, &c. requiring external stimulants, an embrocation composed of a strong aqueous solution of corrosive sublimate and camphorated alcohol, in equal proportions, applied freely to the surface, has been found remarkably efficacious in exciting the action of the torpid vessels, and speedily restoring the circulations in the most desperate circumstances.

Sub-Murias Hydrargyri. *Sub-Muriate of Quicksilver.* Calomel.

Take of

Muriate of quicksilver, ground to powder in a glass mortar, four ounces,
Purified quicksilver, three ounces.

Rub them together in a glass mortar, with a little water, to prevent the acrid powder from rising, until the quicksilver be extinguished; and having put the powder, after being dried, into an oblong phial, of which it fills one third, sublime from warm sand. After the sublimation is finished, having broken the phial, throw away both the red matter found near the bottom of the phial, and the white matter near its neck, and sublime the rest of the mass. Grind this into a very minute powder, which is, lastly, to be washed with boiling distilled water.

In this process, the directions for performing which are sufficiently explicit, an additional quantity of quicksilver is brought into chemical union with the constituent principle of muriate of mercury. In that compound, the metal is highly oxidated, and the oxide is combined with a considerable quantity of muriatick acid. In converting it into the sub-muriate of mercury, as it is named, the portion of metal which is added attracts part of the ogygen of the oxide, and the whole becomes an oxide of mercury, with a comparatively small portion of oxygen; and this oxide, requiring less muriatick acid for its saturation than the one more highly oxidated, finds a sufficient quantity in the pre-existing muriate. The one is merely imperfect oxide of mercury combined with muriatick acid; the other perfect oxide of mercury united to the same acid; the latter at the same time containing more acid in its composition than the former. Mr. Cheneyix's analysis, has fixed the proportions with accuracy.

Those of the muriate, as it has been named, have been already stated; those of the sub-muriate are, muriatick acid, 11.5, oxide of mercury, 88.5, [this oxide being composed of quicksilver, 89.3, and oxygen, 10.7;] so that the ultimate constituent parts of submuriate of mercury, are, quicksilver, 79, oxygen, 9.5, and muriatick acid, 11.5.

The names which have been chosen to distinguish these two muriates of mercury, are not, in the opinion of Mr. Murray, the best that might have been selected. In a chemical point of view, the prefixing the syllable sub, to denote the one, is incorrect, since the use of that syllable is restricted to those salts, in which the case is the same, but when there is a deficiency of acid; and, in the muriate to which it is here applied, the case is not the same, and there is no deficiency of acid, the metallick oxide being saturated, or combined with as much as it is disposed to unite with. As a medical nomenclature, the adoption of it is still more to be regretted, as the merely prefixing the syllable to the same name is insufficient to guard effectually against the dangerous mistake of confounding preparations which differ so widely in their powers.

The epithets *corrosive* and *mild*, have long been made use of, to discriminate them; they do so more clearly, and, as systematick names, they are preferable, as according with the established nomenclature of the metallick salts, which draws the distinctions between the salts formed from the different oxides of the same metal, united with one acid, from some quality in which they differ. The one preparation ought to have been named *murias hydrargyri corrosivus;* the other, *murias hydrargyri mitis.*

This preparation of mercury differs from the former, in being perfectly insipid, and insoluble in water or in alcohol. By sublimation it may be obtained in small, short prisms; but it is usually in the form of a mass, somewhat ductile, semi-transparent and very heavy. It is decomposed by the alkalis, earths, and various compound salts.

A method has lately been introduced by Mr. Howard, of conducting the sublimation in an apparatus, so constructed, that the vapours are not condensed in the upper part of the vessel, forming a solid mass, but are condensed on the surface of water. The aggregation, whence a certain degree of ductility and hardness arise, that renders difficult the levigation of the sublimate, is thus obviated; it is obtained at once, in the state of a fine powder, and any corrosive muriate that may rise with it is abstracted.

The mild muriate of mercury, or calomel, as it is safer to prescribe it by the arbitrary name by which it has been long known, is one of the most useful preparations

of the metal. By proper management, it may be made to increase, in a remarkable manner, almost any of the secretions or excretions. As an anti-venereal, it is given in the dose of a grain, night and morning; or in larger doses, its usual determination to the intestines being prevented, if necessary, by opium. Thus directed, this preparation is capable of curing syphilis in every form. It is the preparation, which is, perhaps, most usually given in the other diseases in which mercury is employed, as in affections of the liver, or neighbouring organs, in cutaneous diseases, chronick rheumatism, tetanus, hydrophobia, hydrocephalus, and febrile affections, especially those of warm climates. It is employed as a cathartick alone, or to promote the operation of other purgatives. With jalap it forms the favourite cathartick of Dr. Rush, in bilious and in yellow fevers; with rhubarb, it is highly extolled by sir John Pringle, in dysentery. Its anthelmintick power is justly celebrated; and it is perhaps superiour to the other mercurials, in assisting the operation of diureticks in dropsy. Combined with diureticks, it proves diuretick; and with sudorificks, sudorifick. It also produces very salutary effects in obstructions, and chronick inflammations of the viscera, especially of the liver; and in general, either with or without opium, it is applicable to every case, in which mercurials are indicated. Combined in the proportion of one part of opium to four of calomel, it is administered with very great success in almost every form of active inflammation. In the autumnal fevers of our climate, and in typhus gravior, and mitior, calomel either by itself, or combined with opium, or the volatile alkali, is deservedly considered as the most prominent of all our means of cure; and in diseases of the liver, whether acute or chronick, venesection being premised, calomel is deemed indispensable, and more than any other a sovereign remedy. In angina maligna, calomel is esteemed as highly beneficial; and in croup it is incomparably the most efficacious in subduing its violence. In one case of a child two years old, Dr. Hamilton gave to the extraordinary amount of one hundred grains in twenty-four hours. To one of five months, thirty-two grains in twenty-four hours; and to another, eighty-four grains in seventy-two hours. Such examples, however, will not be imitated by physicians in general. In cholera infantum, the superiour efficacy of calomel has been confirmed by ample experience; and it

is the principal resort of every experienced physician. In pneumonick inflammation, calomel has long been a favourite remedy among the physicians of New England; and after arterial action is reduced by the lancet, it will not fail to relieve the cough, and promote expectoration. Mercury was introduced by Dr. Rush as a remedy in pulmonary consumption. In a few instances it has been successful; but it retains no reputation, excepting in those cases which depend on a venereal taint, or previous disease of the liver. In confirmed phthisis pulmonalis, in general, its indiscriminate employment proves extremely detrimental. In chronick dysentery, a moderate course of mercury is sometimes the most effectual means of relief; and in Devonshire colick, it is highly serviceable. In rheumatism, mercury combined with opium, is often productive of the happiest effects. In the late fatal epidemick, called spotted fever, and typhoid pneumonia, calomel has been resorted to with such effect as to obtain high encomiums among the means of cure; but its efficacy is much increased by a combination with opium, or the volatile alkali. As a vermifuge, says a late writer, "repeated experience has convinced me, that no remedy is so safe, so mild, or so certain, as *calomel*. Procure the medicine from an apothecary of character, give it in the dose suited to the age and constitution of the child, and keep him warm during the operation, avoiding cold and sour drinks, for two or three days, and no danger can ever attend the use of the remedy. Rhubarb or jalap may be mixed with the calomel to quicken the operation. A nausea, which sometimes comes on during the operation, may be relieved by mint water; and an unnecessary purging may be restrained by two or three drops of *laudanum*. A child, between the ages of two and four years, in general, may take from one to three grains at a dose in syrup." From its great specifick gravity, it ought always to be given in the form of bolus or pill.

As a cathartick, its dose for an adult may be from five to ten or twenty grains, or more. It is worthy of remark that when taken in a dose of twenty-five or thirty grains, calomel operates with less disturbance to the system than when a dose of six or eight grains is given. The larger dose exciting an action adequate to its own expulsion, while the smaller quantity occasions a continual irritation on the coats of the intestines. Calomel, within a few

years, has been extensively used as a medicine. It should never be trifled with ; and, during its exhibition, confinement to an equable temperature in a room, is indispensable. The best way to give it, is in small doses regularly, so that the effects may be gradually exerted on the system ; and the impression once made, should be carefully kept up as long as is necessary, to prevent much loss of time.

The patient who commences a course of mercury, besides beginning with small doses and proceeding gradually, should be careful not to stimulate the salivary glands either by rubbing or keeping the parts too warm with flannel. He should likewise avoid as much as possible any exposure to cold, which will endanger inflammation, and tumefaction of these glands, and thereby give rise to a salivation. His diet should consist of plain animal food, thin broths, puddings, milk, vegetables, ripe fruit, &c. carefully avoiding all salted and high seasoned meats, spirituous liquors and acids ; and in fact abstaining from every substance of a heating or stimulating nature.

One grain of calomel mixed with sugar, and snuffed up the nostrils, is recommended as a powerful errhine in amaurosis. The same mixture is blown into the eye to remove specks from the cornea.

The general use of that excellent medicine *calomel*, says the judicious writer above referred to, renders its perfect preparation a matter of great importance.

The following method to determine its purity is given by an able chemist, Mr. Frederick Accum.

" Calomel ought to be perfectly saturated with mercury. Complete saturation can only be known, by boiling for a few minutes, one part of calomel and one twelfth part muriate of ammonia in ten parts of distilled water. The fluid must then be filtrated and examined by means of carbonate of potass. If the calomel be well prepared, no change will take place on the addition of this re-agent ; but, if the preparation be imperfect, a precipitate will ensue, forty-seven parts of which indicate forty-eight of muriatick acid. One hundred and fourteen parts of calomel perfectly saturated with mercury contain ninety-seven of metal, and nineteen of acid. It should be perfectly inodorous and tasteless, and when rubbed in a stone mortar with ammonia, become intensely black."

SUB-MURIAS HYDRARGYRI PRÆCIPITATUS. *Precipitated Sub-Muriate of Quicksilver.* Calomel.

Take of
Diluted nitrous acid,
Purified quicksilver, each eight ounces,
Muriate of soda, four ounces and a half,
Boiling water, eight pounds.

Mix the quicksilver with the diluted nitrous acid; and towards the end of the effervescence digest with a gentle heat, frequently shaking the vessel in the mean time. But it is necessary to add more quicksilver to the acid than it is capable of dissolving, that a perfectly saturated solution may be obtained.

Dissolve at the same time the muriate of soda in the boiling water, and into this solution pour the other, while still hot, and mix them quickly by agitation. Pour off the saline liquor after the precipitate has subsided, and wash the sub-muriate of quicksilver by repeated affusions of boiling water, which is to be poured off each time after the deposition of the sub-muriate, until the water come off tasteless.

Mild muriate of mercury is in this process obtained by a double elective attraction. On mixing together the solutions of nitrate of mercury and muriate of soda, the nitrick acid is attracted by the soda, and the muriatick acid by the oxide of mercury. In order that the mild, and not the corrosive muriate should be formed, it is evident, that the mercury in the nitrous acid should be in its least oxidated state. Mild muriate of mercury, prepared in this mode, is precisely the same in its chemical composition, as when formed by the former process of sublimation. It has been supposed, however, that it differs somewhat in its operation, and that in particular it is more liable to purging. If such difference ever existed, it is probably owing to the presence of the subnitrate of mercury, which, when the usual directions are observed, may be mixed with the mild muriate. If the latter be pure, its operation must be the same as that of the muriate prepared by sublimation, as it differs from it only in being of a much finer powder than the other can be reduced to, and this has been supposed to give it some superiority.

Sub-Murias Hydrargyri et Ammoniæ. *Sub-Muriate of Quicksilver and Ammonia.* White Precipitate of Mercury.

Take of
Muriate of quicksilver,
Muriate of ammonia,
Solution of carbonate of potass, each half a pound.

Dissolve first the muriate of ammonia, afterwards the muriate of quicksilver, in distilled water, and add to these the solution of carbonate of potass. Filtrate and wash the powder until it become insipid.

The theory of this process is somewhat complicated. The potass decomposes the muriate of ammonia, by combining with the muriatick acid; and the disengaged ammonia decomposes the muriate of mercury. Hence, if ammonia be added to a solution of corrosive muriate of mercury, the same preparation is obtained as by this process. The action of the ammonia in decomposing the corrosive muriate of mercury, is also somewhat peculiar. It does not merely attract the muriatick acid, and separate the pure mercurial oxide, but this oxide retains combined with it a portion both of the ammonia and acid. It is, therefore, a triple compound, consisting, (according to Fourcroy's analysis of it by decomposing it by heat,) of eighty-one parts of oxide of mercury, sixteen of muriatick acid, and three of ammonia.

This preparation, sub-murias hydrargyri et ammoniæ, formerly known by the name of *white precipitate of mercury*, is used, only externally in the form of ointment, as an application in some cutaneous affections.

Oxidum Hydrargyri Cinereum. *Ash-coloured Oxide of Quicksilver.* Ash-coloured powder of Mercury.

Take of
Purified quicksilver, four parts,
Diluted nitrous acid, five parts,
Distilled water, fifteen parts,
Solution of carbonate of ammonia, a sufficient quantity.

Dissolve the quicksilver in the nitrous acid; then gra-

dually add the distilled water, and pour into the mixture as much water of the carbonate of ammonia as shall be sufficient to precipitate the whole of the oxide of quicksilver; which is then to be washed with pure water and dried.

In this process, the nitrick acid oxidates the mercury, and combines with the oxide. The action of ammonia on the nitrate of mercury, is peculiar: it does not merely decompose it by combining with the acid, and separating the oxide, but it exerts a farther action on the oxide, partially deoxidating it, by part of its hydrogen attracting a part of the oxygen. The oxide precipitated, therefore, is that in which the metal is combined with the least proportion of oxygen.

In order, however, that this may be the nature of the precipitate, it is necessary that the solution of the mercury in the nitrick acid should have been made in the cold, and with a diluted acid. When, from these circumstances not having been attended to, the mercury has been too highly oxidated, ammonia throws down from the solution a white precipitate; and the present preparation is often met with, of a light gray colour, from the intermixture of this precipitate, with the dark coloured oxide. When properly prepared, it is of a dark blue colour.

Ash-coloured oxide of mercury is very similar in its operation to the preparations in which quicksilver is oxidated by trituration. It is given as an antivenereal, in a dose of one grain night and morning, generally in the form of pill.

Oxidum Hydrargyri Rubrum, per Acidum Nitricum.

Red Oxide of Quicksilver, by Nitrick Acid. Red precipitated Mercury.

Take of

Purified quicksilver, one pound,
Diluted nitrous acid, sixteen ounces.

Dissolve the quicksilver, and evaporate the solution, with a gentle heat, to a dry white mass; which, after being ground into powder, is to be put into a glass cucurbit, and to have a thick glass plate laid upon its surface. Then, having adapted a capital, and placed the vessel in a sand bath, apply a gradually increased heat, until the matter be converted into very red scales.

The quicksilver is in this preparation first oxidated by the nitrous acid, and then combined with a portion of it. By the increase of heat, this nitrate is decomposed, and the greater part of the acid expelled: it is doubtful, however, if it be ever wholly expelled, so as to leave a pure oxide, the preparation being different in appearance from the red oxide, obtained by the heat, and being always much more acrid. It is too much so for internal use. It is principally used externally, as an escharotick.

Sub-Sulphas Hydrargyri Flavus. *Yellow Sub-Sulphate of Quicksilver.* Turpeth Mineral.

Take of
Purified quicksilver, four ounces,
Sulphurick acid, six ounces.

Put them into a glass cucurbit, and boil them in a sand bath to dryness. Throw into boiling water the white matter, which is left in the bottom, after having reduced it to powder. A yellow powder will immediately be produced, which must be frequently washed with warm water.

The quicksilver is first oxidized by the sulphurick acid, and afterwards combined with it, forming super-sulphate of mercury; by the continuance of the heat, this is partially decomposed, and a sub-sulphate of mercury remains. On this, boiling water is poured; a portion of sulphate of mercury still present in the saline matter is dissolved; and the yellow powder which remains is an oxide of mercury, with a small quantity of sulphurick acid combined with it.

It is a strong emetick, and with this intention, operates more powerfully than any of the mercurials which can be safely given internally. Its action, however, is not confined to the primæ viæ; it will sometimes excite a salivation if a purgative be not taken soon after it. This medicine is chiefly used in virulent gonorrhœas, and other venereal cases, when there is a great flux of humours to the parts. Its chief use at present is in swellings of the testicle from a general affection; and it seems not only to act as a mercurial, but also, by the vomiting it occasions, to perform the office of a discutient, by accelerating the motion of the blood in the parts affected.

It is said, likewise, to have been employed with success in robust constitutions, against leprous disorders, and ob-

stinate glandular obstructions. The dose is from two to six or eight grains. It may be given in doses of a grain or two, as an alterative and diaphoretick. It is a violent errhine, and has been employed as such, mixed with any mild vegetable powder.

Turpeth mineral is a valuable medicine as an emetick in croup, and as an expectorant in pleurisy and peripneumony.

SULPHURETUM HYDRARGYRI NIGRUM. *Black Sulphuret of Quicksilver.* Æthiops Mineral.

Take of
Purified quicksilver,
Sublimed sulphur, each equal weights.

Grind them together in a glass mortar, with a glass pestle, till the globules of quicksilver totally disappear.

It is also prepared with twice the quantity of quicksilver.

By this trituration, a chemical combination appears to be effected between the quicksilver and sulphur; and perhaps the metal is at the same time imperfectly oxidated. It is in the form of a very black powder.

The combination is much facilitated by the application of heat, and it can at once be effected by adding the quicksilver to the melted sulphur.

This is, perhaps, the most inactive of the mercurial preparations. It is principally used as an alterative in glandular affections, and in cutaneous diseases. As an anthelmintick, it is sometimes given in a dose of five or ten grains, according to the age. But even in doses of several drachms, continued for a considerable length of time, it has scarcely produced any sensible effect.

SULPHURETUM HYDRARGYRI RUBRUM. *Red Sulphuret of Quicksilver.* Factitious Cinnabar.

Take of
Purified quicksilver, forty ounces,
Sublimed sulphur, eight ounces.

Mix the quicksilver with the melted sulphur, and if the mixture take fire, extinguish it by covering the vessel; afterwards reduce the mass to powder, and sublime it.

In this preparation it was conceived, that, during the inflammation of the materials, the quicksilver was oxidated; and, that therefore the resulting compound was a combination of sulphur and oxide of mercury. The extrication of heat and light, which arises from the mutual action of the ingredients, appears, however, not to be an example of oxygenation, but, to be rather of the same kind, as that which takes place from the combination of different metals with sulphur; and, according to the analysis of Proust, cinnabar consists of sulphur with metallick mercury, in the proportion of fifteen of the former, to eighty-five of the latter.

Red sulphuret of quicksilver is sometimes used in fumigations, against venereal ulcers in the nose, mouth, and throat. Half a drachm of it burnt, the fume being imbibed with the breath, has occasioned a violent salivation. This effect is by no means owing to the medicine as a sulphuret; for, when set on fire, it is no longer such, but mercury dissolved into vapour, and blended with sulphurous acid gas; in which circumstances, this mineral has a very powerful effect.

Mr. Pearson, from his experiments on mercurial fumigation, concludes, that where checking the progress of the disease suddenly is an object of great moment, and where the body is covered with ulcers, or large and numerous eruptions, and in general, to ulcers, fungi, and excrescences, the vapour of mercury is an application of great efficacy and utility; but that it is apt to induce a ptyalism rapidly, and great consequent debility; and, that for the purpose of securing the constitution against a relapse, as great a quantity of mercury must be introduced into the system by inunction, as if no fumigation had been employed.

GOLD.

Auri Murias. *Muriate of Gold.*

"Dissolve a portion of the gold coin of the United States, previously cut into small pieces, in the nitro-muriatick acid. Boil down the solution to dryness; add to this residuum an equal quantity of the muriate of soda; mix them well together. Then dissolve them in a small quantity of pure water, and boil down to dryness. Collect what remains, and preserve it in a close stopped phial for use."—[*Pharm. of New York Hospital.*]

For the properties and use of this preparation, the reader is referred to the articles *aurum* and *pilulæ auri muriatis*, in this work.

LEAD.

ACETIS PLUMBI. *Acetite of Lead.* Sugar of Lead.

Take of

White oxide of lead, any quantity; put it into a cucurbit, and pour upon it of

Distilled acetous acid, ten times its weight.

Let the mixture stand upon warm sand till the acid become sweet; when it is to be poured off, and fresh acid added until it cease to become sweet. Then evaporate all the liquor, freed from impurities, in a glass vessel, to the consistence of thin honey, and set it aside in a cold place, that the crystals may be formed, which are to be dried in the shade. The remaining liquor is again to be evaporated, that new crystals may be formed; and the evaporation is to be repeated until no more crystals concrete.

The oxide of lead is in this preparation combined with acetous acid; the salt formed concretes in acicular crystals. The process is generally carried on on a large scale, to furnish it for various purposes in the arts.

Like the other preparations of lead, this is a violent poison. It has been used internally, however, as a styptick, in profuse menorrhagia, in a dose of half a grain, repeated every half hour. But its employment requires much caution. The internal use of acetite of lead, says Dr. Duncan, notwithstanding the encomiums some have been rash enough to bestow upon it, is entirely to be rejected. It forms, however, a valuable external application, in superficial and phlegmonick inflammations, bruises, and diseases of the skin. It is always applied in solution, either simply, as to the eyes, or by means of cloths soaked in it, or mixed with bread crumb. A drachm, with five ounces of any distilled water, forms a strong solution, and with ten ounces of water, a weak solution. If common water be used, the addition of about a drachm of acetous acid will be necessary to keep the lead in solution. It is frequently employed as an injection in gonorrhœa, and a collyrium in ophthalmia. Lately, acetite of lead has been exhibited internally with satisfac-

tory success, in obstinate cases of diarrhœa, and in the closing stage of dysentery. Dr. John Archer, jun. of Maryland, and some others, speak of it in terms of great praise. Professor Rush has made some successful trials of this medicine in the epilepsy of children; and it has been exhibited with advantage in hysteria and chorea. The dose for adults is from one to three or four grains, and for children, from one quarter to one grain, according to the strength and exigency of the case. [See Med. Repos. vol. 3.]

Aqua Lithargyri Acetati. *Water of Acetated Litharge.* Extract of Lead.

Take of
Litharge, one pound,
Strong vinegar, two pints.

Put them together into a glazed earthen pipkin, and let them boil, or rather simmer, for an hour, or an hour and a quarter, taking care to stir them all the while, with a wooden spatula. After the whole has stood to settle, pour off the liquor, which is upon the top, into bottles for use.

This is the original preparation of Goulard, a French surgeon, who many years since introduced it into practice under the name of *extract of saturn;* one hundred drops of which, with four tea spoonfuls of brandy, mixed with a quart of water, form his famous *vegeto-mineral water.* The proportion of the extract may be increased or diminished according to the nature of the disorder, or the greater or less degree of sensibility of the part affected. In his treatise on the virtues of lead, the author has bestowed on this preparation high commendation, as a remedy in various external diseases, such as inflammations, burns, bruises, strains, and ulcers. He likewise prepares with his extract, a number of other compositions, as cataplasms, plasters, ointments, cerates, &c. which he affirms are happily adapted to the indications, in phlegmon, scirrhous and indolent tumours, and in anchylosis, and other rigid states of the joints and tendons. Every purpose, however, to be answered by these, may probably be obtained from the employment of the other preparations of lead in common use. Goulard's extract may be considered as analogous to a solution of acetite of lead in water, with an excess of acid, and

must be always variable in strength. It is applied to the same external purposes as the acetite of lead; but from long experience we are disposed to admit its superiour utility in many particulars.

ZINC.

Oxidum Zinci. *Oxide of Zinc.* Flowers of Zinc.

Let a large crucible be placed in a furnace filled with live coals, so as to be somewhat inclined towards its mouth; and when the bottom of the crucible is moderately red, throw into it a small piece of zinc, about the weight of a drachm. The zinc soon inflames, and it is at the same time converted into white flakes, which are from time to time to be removed from the surface of the metal with an iron spatula, that the combustion may be more complete; and at last, when the zinc ceases to flame, the oxide of zinc is to be taken out of the crucible. Having put in another piece of zinc, the operation is to be repeated, and may be repeated as often as is necessary. Lastly, the oxide of zinc is to be prepared in the same way as the carbonate of lime.

Zinc is the most inflammable of the metals. At the temperature of ignition, it attracts the oxygen of the atmospherick air, and burns vividly. The product is a white oxide, insipid, insoluble, and infusible.

White oxide of zinc is applied externally, as a detergent, and exsiccant remedy. With twice its weight of axunge, it forms an excellent application to deep chops, or excoriated nipples. But, besides being applied externally, it has also of late been used internally. In doses from one to seven or eight grains, it has been much celebrated in the cure of epilepsy, and several spasmodick affections; and there are sufficient testimonies of their good effects, where tonick remedies in those cases are proper.

Carbonas Zinci Impurus Præparatus. *Prepared Impure Carbonate of Zinc.* Prepared Calamine.

The impure carbonate of zinc, after being roasted by those who make brass, is prepared in the same way as carbonate of lime.

Calamine is an ore of zinc, in which, sometimes the metal is merely oxidated, and in other varieties combined with carbonick acid. It is used as an application to superficial inflammation, dusted on the part, and as the basis of the common healing cerate. For these purposes, it ought to be very finely levigated.

Oxidum Zinci Impurum Præparatum. *Prepared Impure Oxide of Zinc.* Prepared Tutty.

This is prepared in the same manner as carbonate of lime.

Tutty is a substance of which the origin is doubtful, but it appears to be artificial, and to consist chiefly of oxide of zinc with argillaceous earth. It is used externally for the same purposes as calamine; and hence requires to be very finely levigated.

Sulphas Zinci. *Sulphate of Zinc.* White Vitriol.

Take of

Zinc, cut into small pieces, three ounces,
Sulphurick acid, five ounces,
Water, twenty ounces.

Mix them, and when the effervescence is finished, digest the mixture for a little while on hot sand; then strain the decanted liquor through paper; and after proper evaporation, set it apart that it may crystallize.

The sulphurick acid, by a disposing affinity, enables the zinc to oxidate itself by decomposing the water, and then combines with the oxide. The salt is obtained in acicular crystals. The process, however, is scarcely ever performed in the shops, the sulphate of zinc being prepared on a large scale, from certain varieties of the native sulphuret of the metal. As the crystallization of it is difficult, it is always in the form of hard white masses. The London pharmacopœia orders this salt to be purified, by dissolving it in water, adding a small portion of sulphurick acid, and crystallizing.

Sulphate of zinc in doses of from ten grains to half a drachm, operates almost instantly as an emetick, and is at the same time perfectly safe. It is therefore given, when immediate vomiting is required, as in cases when poison has been swallowed. By administering it internally, in

small doses, it acts as a good tonick ; and some physicians in the southern states employ it to cure intermittent fevers, which it frequently does even after the bark has been given without success. Dose for adults from two to five grains ; for children in proportion. Dr. Mosely, of Jamaica, states that, in chronick dysentery unattended with fever, there is not a more efficacious remedy than the following solution, taken every morning, and an opiate at bed time. Take sulphate of zinc three drachms, alumen two drachms, spirit lavender half an ounce, boiling water one pint. Dose for adult from four to six drachms, on an empty stomach, without diluting it, in some cases to be repeated every six hours. When evacuations are required, the quantity of alum may be diminished, or entirely omitted; and when astringency is required, the alum increased, and the sulphate of zinc diminished. Externally this medicine is used as a styptick application to stop hæmorrhages, diminish increased discharges, as gonorrhœa ; and to cure the external inflammations, arising from debility and relaxation of the blood vessels, as in some cases of ophthalmia.

Externally, this medicine is used as a styptick application to stop hæmorrhages and diminish increased discharges ; two grains being dissolved in an ounce of water is in common use as an injection in gonorrhœa, when the inflammatory state has subsided, and in gleet. A solution of nearly the same strength is likewise used as a collyrium in ophthalmia, the astringent power of this being increased by the addition of a few drops of sulphurick acid. Dissolved with alum it forms a very styptick liquor, which has long been in use for stopping hæmorrhage and checking increased discharges by external application.

Solutio Acetitis Zinci. *Solution of Acetite of Zinc.*

Take of

Sulphate of zinc, a drachm,
Distilled water, ten ounces.

Dissolve.

Take of

Acetite of lead, four scruples,
Distilled water, ten ounces.

Dissolve.

Mix the solutions; let them stand at rest a little, and then filter the liquor.

The sulphurick acid of the sulphate of zinc, is attracted by the oxide of lead; the acetous acid of the acetite of lead, by the oxide of zinc; the sulphate of lead, being insoluble, is precipitated; the acetite of zinc remains in solution.

This solution is used as an injection in gonorrhœa; it is considered as more astringent than the acetite of lead, and less irritating than the sulphate of zinc.

Liquor Arsenicalis. *Arsenical Solution.* (Lond. Pharm.)

Take of

Prepared oxide of arsenick, in very fine powder,
Subcarbonate of potass from tartar, of each sixty-four grains.
Distilled water, a pint.

Boil them together in a glass vessel until the arsenick be entirely dissolved. When the solution is cold, add compound spirit of lavender four fluidrachms: then add as much distilled water as may be necessary to make up the measure of a pint.

By combination with potass arsenick is rendered soluble in water; and to render the solution of it more perfect, and obtain it in a form in which its dose can be easily regulated, is the object of the present process. The formula was introduced by Dr. Fowler, as giving a substitute for the arsenical preparation known under the name of tasteless ague drop. Each ounce of the solution contains four grains of the oxide. The dose of this solution should be accurately regulated as follows: From two years old to four, two drops, or three to five; from five to seven, five to seven drops; from eight to twelve, seven to ten drops; from thirteen to eighteen, ten to twelve drops, and the same to adults. These doses may be repeated once in eight or twelve hours, diluted with gruel or barley water. The spirit of lavender is added merely to communicate colour and flavour.

The particular diseases in which arsenick has been found useful as a remedy, have been enumerated under its medical history, in the materia medica.

Solutio Murias Hydrargyri. Solution of Corrosive Sublimate.

Take of

Corrosive Sublimate eight grains,
Common brandy, four ounces, mix and dissolve.

In this form the muriate of mercury may be exhibited with great convenience and safety. It is particularly adapted to the use of delicate children, and even infants labouring under some hereditary venereal taint, obstinate eruptive disease, or other symptoms indicating an alterative course. In these circumstances this preparation proves a mild, safe, and very effectual remedy. Dose, four drops to a child of one year, and six or eight to one of three years, three times a day, in a little sweetened water.

CHAPTER IV.

ETHER, AND ETHERIAL SPIRITS.

Æther Sulphuricus. *Sulphurick Ether.* Vitriolick Ether.

Take of

Sulphurick acid,
Alcohol, each thirty-two ounces.

Pour the alcohol into a glass retort fit for sustaining a sudden heat, and add to it the acid in an uninterrupted stream.

Mix them by degrees, shaking them moderately and frequently: this done, instantly distil from sand previously heated for the purpose, into a receiver kept cool with water or snow. But the heat is to be so managed, that the liquor shall boil as soon as possible, and continue to boil till sixteen ounces be drawn off: then let the retort be removed from the sand.

To the distilled liquor add two drachms of potass; then distil from a very high retort, with a very gentle heat, into a cool receiver, until ten ounces have been drawn off. If sixteen ounces of alcohol be poured upon the acid re-

maining in the retort after the first distillation, and the distillation be repeated, more ether will be obtained, and this may be repeated several times.

In the formation of sulphurick ether, it is found by experiment, that the alcohol suffers decomposition; a portion of its carbon is separated in a sensible form, and renders the residual liquor thick and dark coloured; a quantity of water is formed, and the remaining elements of the alcohol unite to form the ether. Ether differs from alcohol in containing less carbon, or rather more hydrogen; and this difference is established, not only by the facts with regard to its formation, but likewise by the comparative products of their combination. With regard to the agency of the sulphurick acid, by which these changes are effected in the composition of the alcohol, two opinions are at present maintained by chemists. According to the older doctrine, part of the sulphurick acid is decomposed; its oxygen combines with a portion of the hydrogen of the alcohol, and forms water; the balance of attractions among the elements of the alcohol being broken, carbon is deposited, and ether formed from a new combination of these remaining elements.

The ether obtained by the first distillation is impure. It is diluted with water and alcohol, and impregnated generally with sulphurous acid. It is rectified, according to the directions in the pharmacopœia, by distilling it a second time with a very gentle heat, with the addition of potass, which attracts the sulphurous acid; or, what succeeds better, with the addition of black oxide of manganese, which converts that acid into sulphurick.

Ether properly prepared, has a penetrating diffusive odour, and a very pungent taste. It is highly volatile, evaporating rapidly at the common temperature of the atmosphere. It is soluble in ten parts of water, and combines with alcohol in every proportion. The different ethers, as produced by the different acids, vary in their composition and proportions. They are the lightest and most volatile of all known fluids, and are highly inflammable; their smell is fragrant, and taste hot and pungent.

In their medicinal powers, the ethers resemble alcohol; but they are rather less permanent in their action.

Sulphurick ether, or that obtained from the action of sulphurick acid on alcohol, is principally used. As a medicine taken internally, it is an excellent antispasmo-

dick, cordial, and stimulant. It has been used in cases of rheumatism, gout, and hooping-cough, with great success. In a paroxysm of suffocating asthma, and all those diseases where the organs of respiration are affected, half a tea spoonful of ether in a table spoonful of water, quickly swallowed and occasionally repeated, has often produced instant relief. Even the simple evaporation of this volatile fluid, a spoonful of which may be placed at a time in a shallow vessel contiguous to the patient, has frequently been found of service, and alleviated the most distressing shortness of breath. Or in catarrhal and asthmatick complaints, its vapour may be inhaled with advantage, by holding in the mouth a piece of sugar, on which ether has been dropped. It is given as a cordial in nausea, and in febrile diseases of the typhoid type; as an antispasmodick in hysteria, and in other spasmodick and painful diseases; as a stimulus in soporose and apoplectick affections; and to mitigate the unpleasant sensation of sea sickness. Regular practitioners seldom give so much as half an ounce, much more frequently only a few drops for a dose; but empyricks have sometimes ventured upon much larger quantities, and with incredible benefit. When applied externally, it is capable of producing two very opposite effects, according to its management; for, if it be prevented from evaporating, by covering the place to which it is applied closely with the hand, it proves a powerful stimulant and rubefacient, and excites a sensation of burning heat. In this way it is frequently used for removing pains in the head; and Dr. Conyers declares, that a tea spoonful applied to the affected jaw, and repeated till the pain cease, is a never failing remedy for the tooth-ache. But, if it be dropped on any part of the body, exposed freely to the contact of the air, its rapid evaporation produces an intense degree of cold; and as this is attended with a proportional diminution of bulk in the part, applied in this way it has frequently facilitated the reduction of strangulated hernia. The great utility of ether in effecting this last purpose, has been confirmed by recent experience. To mitigate sea sickness, put a tea spoonful of sulphurick ether to a wine glass full of water, with some refined sugar previously dissolved in a phial, let the ether be put in quickly, and shake them well together. Take this for a dose, and repeat it as occasion may require, but not oftener than every four hours.

ÆTHER SULPHURICUS CUM ALCOHOLE. *Sulphurick Ether with Alcohol.* Dulcified Spirit of Vitriol.

Take of
Sulphurick ether, one part,
Alcohol, two parts.

Mix them.

By this dilution of ether with alcohol, little is gained, except that it is more soluble in water. It was formerly known by the name of spirit of vitriolick ether. The London college apply that name to ether obtained by the first distillation, and unrectified. But this, and some other similar preparations directed by that college, may be regarded as superfluous.

SPIRITUS ÆTHERIS NITROSI. *Spirit of Nitrous Ether.* Dulcified Spirit of Nitre.

Take of
Alcohol, three pounds,
Nitrous acid, one pound.

Pour the alcohol into a capacious phial, placed in a vessel full of cold water, and add the acid by degrees, constantly agitating them. Let the phial be slightly covered, and placed for seven days in a cool place; then distil the liquor with the heat of boiling water into a receiver, kept cool with water or snow, as long as any spirit comes over.

This is a solution of nitrous ether in alcohol. To prepare pure nitrous ether is difficult, and not without danger, from the violent chemical action which takes place when so much nitrous acid is added as is necessary to convert the whole alcohol into ether. This pharmaceutick preparation, therefore, has been preferred, and, as a medicine, answers perhaps all the purposes which could be derived from the ether. Even it requires caution in its preparation.

The theory of the action of acids on alcohol, and of the formation of ethers, is, notwithstanding modern researches, obscure; and that of nitrous ether is very imperfectly elucidated. It is ascertained, however, that during its production, portions of oxalick and acetous acids are formed; and the experiments of Bayen have clearly proved, that a very considerable portion of the nitrick

acid is decomposed or combined in such a manner with the principles of the alcohol, that it is no longer capable of saturating an alkali. Perhaps it may be inferred, that the acid, by parting with oxygen to the elements of the alcohol, causes the formation of the oxalick and acetous acids, and that the remaining elements of the alcohol unite to form the ether. It appears to contain more carbon than sulphurick ether.

The spirit of nitrous ether always contains a very sensible portion of acid, from which it may be freed by a second distillation, with the addition of magnesia or potass. But on this acid, perhaps, some of its virtues depend.

Its odour is extremely fragrant, its taste pungent and acidulous; it is very volatile and inflammable; soluble in alcohol and water.

Dulcified spirit of nitre has been long deservedly held in great esteem. It quenches thirst, promotes the natural secretions, expels flatulences, and moderately strengthens the stomach. It may be given in any convenient vehicle. Dose from two to four drachms. Mixed with a small quantity of spiritus ammoniæ aromaticus, it proves a mild, yet efficacious diaphoretick, and often remarkably diuretick; especially in some febrile cases, where such a salutary evacuation is wanted. It is employed as a refrigerant and diuretick; sometimes as an antispasmodick. Dulcified spirit of nitre given to the extent of half an ounce, combined with one drachm of liquid laudanum, and repeated every half hour, has been found remarkably efficacious in the removal of strangury from whatever cause it may arise. A small proportion of this spirit, added to malt spirits, gives them a flavour approaching to that of French brandy.

CHAPTER V.

EXPRESSED AND INSPISSATED JUICES.

Vegetable juices are obtained by expression. They consist of various proximate principles of the plant, particularly of mucilage, extractive matter, tannin, fecula, and some saline substances dissolved or suspended in water,

and when recent, may possess the medicinal virtues which belong to any of these principles. It is impossible, however, to preserve vegetable matter in solution in water for any length of time without suffering decomposition, and hence juices are unfit for officinal preparations. Where the virtues of any vegetable reside in a principle which is contained in the juice obtained from it by expression, and where this principle is at the same time not volatile, inspissation by a moderate heat will contribute to its preservation, as the soft mass obtained by this process is much less liable to chemical changes than when the reaction of its constituent parts is favoured by dilution with water. The preparation, however, is still liable to disadvantages. By the heat employed in the inspissation, part of its active matter is generally dissipated; and another source of injury is derived from the oxygenation which the extract is liable to suffer when thus heated in contact with the atmospherick air; and the preparation itself being still soft and humid, must gradually undergo chemical alterations. Hence, inspissated juices are generally variable in their medicinal qualities.

Succus Spissatus Aconiti Napelli. *Inspissated Juice of Aconite, or Wolfsbane.*

The fresh leaves of the aconite are to be bruised, and being enclosed in a hempen bag, are to be pressed strongly, that they may give out their juice, which is to be reduced by evaporation in open vessels heated by boiling water saturated with muriate of soda to the consistence of thick honey. The mass, after it has cooled, is to be kept in glazed earthen vessels, and moistened with alcohol. This inspissated juice is the form under which wolfsbane was introduced into practice by Storck. He recommended it in glandular swellings, scrofulous and venereal affections, gout, and in obstinate chronick rheumatism, in a dose of half a grain, night and morning, and gradually increased to five or six grains. In modern practice it is very seldom prescribed.

In the same manner are prepared the following inspissated juices from the leaves of their respective plants.

Succus Spissatus Atropæ Belladonnæ. *Inspissated Juice of Deadly Night Shade.*

The inspissated juice of belladonna has been recommended by the German physicians in schirrus, cancer, epilepsy, mania, and hydrophobia, in a dose of one grain, and gradually increased. It retains the peculiar property of the plant, that of occasioning dilatation of the pupil; whence it has also been prescribed in amaurosis.

Succus Spissatus Conii Maculati. *Inspissated Juice of Hemlock.*

Under this form, hemlock was employed by Storck in schirrus and cancer. The dose is at first two grains, but it requires to be quickly increased, and it has at length been taken to the extent of several drachms in the day.

It has already been observed of this plant in the materia medica, that in various spasmodick affections, and in phthisis pulmonalis, its great utility has often been demonstrated.

In this preparation of it, the narcotick power of the plant seems always to be more or less impaired; it is also injured by keeping; and we have no other test of its activity than the strength of its narcotick odour. It is therefore inferiour to the dried leaves of the plant, which are likewise, however, liable to a considerable degree of uncertainty, according to the manner in which they have been dried and preserved. A common form of exhibition is that of the inspissated juice made into pills by the addition of a sufficient quantity of the powder of the leaves; but on the whole, the powder alone is to be preferred, both as being in general more active and uniform, and as we have a test of its proper preparation more certain in the richness of its green colour.

Cicuta combined with mercury as in the following form is reported as having proved remarkably successful in the cure of croup.

Take of

Extract cicuta, two drachms,
Quicksilver, half a drachm,
Honey, one ounce,
Mint water, six ounces.

First rub the extract and quicksilver together till the

globules disappear, then mix the honey and water. Add to it a spoonful of spirit to preserve it from moulding. Shake the phial, and give a desert spoonful every four, six, or eight hours, according to the urgency of the case and age of the patient.

Succus Spissatus Hyoscyamus Nigri. *Inspissated Juice of Black Henbane.*

This inspissated juice retains a considerable degree of narcotick power; and the plant resembling opium in its operation it is occasionally employed as a substitute for it. The dose has been usually one grain, which requires to be increased; two grains are perhaps not more than equivalent to one grain of opium. The tincture has been introduced as a more certain preparation.

Succus Spissatus Daturæ Stramonii. *Inspissated Juice of Thorn Apple.*

The inspissated juice of the leaves is the form in which Storck, and other German physicians usually employed the stramonium in maniacal, and in epileptick affections; but of late the saturated tincture is preferred, though an extract made by evaporating a decoction of the leaves, or the leaves themselves in powder, will be found equally convenient and useful. Stramonium is known to be of great importance, and its use is extended to various indications in medicine, as will be seen under that head in the materia medica part of this volume. The dose of the extract or inspissated juice is from one to ten grains.

Pulparum Extractio. *The Extraction of Pulps.*

Boil unripe pulpy fruits, and ripe ones, if they be dry, in a small quantity of water, until they become soft; then press out the pulp through a hair sieve, and afterwards boil it down to the consistence of honey, in an earthen vessel, in a water bath, stirring the matter continually, that it may not burn.

The pulp of cassia fistularis is in like manner to be boiled out from the bruised pod, and reduced afterwards to a proper consistence, by evaporating the water.

The pulps of fruits that are both ripe and fresh, are to be pressed out through the sieve, without any previous boiling.

CHAPTER VI.

FIXED OILS, AND OILY PREPARATIONS.

The chemical properties of these oils have already been described. They exist unmixed in the fruit and seeds of vegetables, and are obtained by expression, or decoction with water. The former is in general to be preferred; and to afford the oil pure it must be performed without heat, which, though it favours the separation of the oil, communicates to it an unpleasant flavour. To preserve them from becoming rancid, they ought to be kept secluded from the air.

A process in pharmacy somewhat difficult is to mix these oils with any watery fluid, so that they may be conveniently exhibited. It is usually done by the medium of mucilage, or of an alkali. If triturated with mucilage, and a small quantity of sugar, the oil is diffused through the water, and a milky liquor formed. A combination still more permanent is effected, by adding a few drops of water of ammonia, or two or three grains of carbonate of potass.

Oleum Amygdali Communis. *Oil of Almonds.*

Take of

Fresh sweet almonds, any quantity.

After having bruised them in a stone mortar, put them into a hempen bag, and express the oil without heat.

The oil thus obtained is the purest of the expressed oils, being entirely free from odour or taste, and is used for the general purposes of expressed oils.

In the same manner is to be expressed from its seeds,

Oleum Lini Usitatissimi. *Oil of Linseed.*

From the seeds of the plant. Being rather less pure, it is used only as an external application.

For the preparation of *oleum ricini*, and *oleum olivarum*. [See those articles in the materia medica.]

OLEUM AMMONIATUM. *Ammoniated Oil.* Volatile Liniment.

Take of
Olive oil, two ounces,
Water of ammonia, two drachms.

Mix them together.

The above preparation may be made with three or four times the quantity of water of ammonia.

This preparation is very frequently used externally as a stimulant and rubefacient. Dr. Pringle observes, that in inflammatory sore throats, a piece of flannel moistened with this liniment, applied to the throat, and renewed every four or five hours, is one of the most efficacious remedies. By means of this warm stimulating application, the neck, and sometimes the whole body, is put into a sweat, which after bleeding either carries off, or lessens the inflammation. When too strong, or too liberally applied, it sometimes occasions inflammations, and even blisters. Where the skin cannot bear the acrimony, a larger proportion of the oil may be used.

OLEUM LINI CUM CALCE. *Linseed Oil with Lime.*

Take of
Linseed oil,
Lime water, of each equal parts.

Mix them.

This liniment is extremely useful in cases of scalds or burns, being singularly efficacious in preventing, if applied in time, the inflammation subsequent to burns or scalds; or even in removing it, after it has come on.

OLEUM SULPHURATUM. *Sulphureted Oil.* Balsam of Sulphur.

Take of
Olive oil, eight ounces,
Sublimed sulphur, one ounce.

Boil them together in a large iron pot, stirring them continually, till they unite.

Sulphureted oil, formerly balsam of sulphur, has been strongly recommended in coughs, consumptions, and other disorders of the breast and lungs. But the reputation which it had in these cases, does not appear to have been derived from any fair trial or experience. It is manifestly hot, acrimonious, and irritating; and should therefore be used with the utmost caution. It has frequently been found to injure the appetite, offend the stomach and viscera, parch the body, and occasion thirst and febrile heats. The dose of it is from ten to forty drops.

Oleum Camphoratum. *Camphorated Oil.*

Take of
Olive oil, two ounces,
Camphor, half an ounce.

Mix them so that the camphor may be dissolved.

This is a simple solution of camphor in fixed oil, and is an excellent application to local pains from whatever cause, and to glandular swellings, which are to be rubbed with the application once, twice, or thrice a day, according to circumstances.

CHAPTER VII.

DISTILLED WATERS, AND SPIRITS.

By distillation of water from vegetable substances, it is frequently impregnated with their flavour and taste. This is owing to their essential oil being volatilized at the temperature at which water boils, and being dissolved in small proportion by the water condensed. It is very seldom that any important virtue of vegetables resides in that principle; and hence the different distilled waters are more used as vehicles of other remedies, than as being themselves active medicines. It is evident that it is only those vegetables which contain a sensible quantity of essential oil, that can be subjected with advantage to this process; and that any quality in the

other principles of the vegetable will not be obtained in the distilled water. To preserve the distilled waters from decomposition, to which they are liable, from the small quantity of vegetable matter they contain, a proportion of alcohol, about one fiftieth of their weight, may be added to them; and they require to be secluded from the air.

Distilled spirits are prepared by distilling pure alcohol, or diluted alcohol, from vegetable substances. Alcohol in its pure state, seldom receives any sensible impregnation; because, although it is capable of dissolving the essential oils of plants, there are very few of them which it can bring over in distillation: a higher temperature being necessary to volatilize them than the alcohol. But, by employing diluted alcohol, a liquor is obtained more odorous and pungent. When heated with the vegetable, the alcohol first distils over, and afterwards the water with the essential oil, and the whole, when condensed, forms a transparent fluid. These distilled spirits, like the distilled waters, are in general merely agreeable vehicles for the exhibition of other medicines, or grateful stimulants, sometimes used to relieve nausea and flatulence. The directions for preparing them are given in the pharmacopœia, under the spirit of caraway.

Aqua Destillata. *Distilled Water.*

Let water be distilled in very clean vessels, until about two thirds of it have come over.

In nature no water is found perfectly pure. Spring or river water always contains a portion of saline matter, principally sulphate of lime; and, from this impregnation, is unfit for a number of pharmaceutick preparations. By distillation a perfectly pure water is obtained.

Aqua Citri Aurantii. *Orange Peel Water.*

Take of

Fresh orange peel, two pounds.

Pour upon it as much water as shall be sufficient to prevent any empyreuma, after ten pounds have been drawn off by distillation.

After due maceration, distil ten pounds.

The same quantity of water is to be distilled in the same manner, from

Six pounds of the recent petals of the Damask rose, to prepare *Aqua rosæ damascenæ.* Damask rose water.

Three pounds of Peppermint in flower.....*Aqua menthæ piperitæ.* Peppermint water.

Three pounds of Pennyroyal in flower.....*Aqua menthæ pulegii.* Pennyroyal water.

One pound and a half of Spearmint in flower.....*Aqua menthæ viridis.* Spearmint water.

One pound of The bark of cinnamon.....*Aqua lauri cinnamomi.* Cinnamon water.

One pound of The bark of cassia.....*Aqua lauri cassiæ.* Cassia water.

Half a pound of The fruit of pimento.....*Aqua myrti pimentæ.* Pimento water.

To each pound of these waters add half an ounce of diluted alcohol.

The virtues of all these waters are nearly alike; and the peculiarities of each will be easily understood by consulting the account given, in the materia medica, of the substances from which they are prepared.

SPIRITUS CARI CARUI. *Spirit of Caraway.* Spirituous Caraway Water.

Take of

Caraway seeds bruised, half a pound,
Diluted alcohol, nine pounds.

Macerate two days in a close vessel; then pour on as much water as will prevent empyreuma, and draw off by distillation nine pounds.

In the same manner is prepared the same quantity of spirit from

One pound of Bark of cinnamon, bruised.....*Spiritus Lauri Cinnamomi.* Spirit of cinnamon.

One pound and a half of *Spiritus*
Peppermint in flower.....*Menthæ piperitæ.*
Spirit of peppermint.
One pound and a half of
Spearmint in flower.....*Menthæ viridis.*
Spirit of spearmint.
Two ounces of
Nutmeg, well bruised.....*Myristicæ moschatæ.*
Spirit of nutmeg.
Half a pound of
The fruit of pimento bruised.....*Myrti pimentæ.*
Spirit of pimento, or allspice.

SPIRITUS LAVANDULÆ SPICÆ. *Spirit of Lavender.* Simple Spirit of Lavender.

Take of
Flowering spikes of lavender, fresh gathered, two pounds,
Alcohol, eight pounds.
Draw off by the heat of boiling water, seven pounds.

By these directions, and in the same quantity is prepared,

SPIRITUS ROBISMARINI OFFICINALIS. *Spirit of Rosemary.*

SPIRITUS JUNIPERI COMPOSITUS. *Compound Spirit of Juniper.*

Take of
Juniper berries, well bruised, one pound,
Caraway seeds,
Sweet fennel seeds, each bruised, one ounce and a half,
Diluted alcohol, nine pounds,
Water, sufficient to prevent empyreuma.

Macerate two days, and draw off nine pounds by distillation.

It is unnecessary to make particular observations on each of these simple spirits, as their virtues are the same with those of the substances from which they are extracted, united to the stimulus of the alcohol.

ALCOHOL AMMONIATUM FŒTIDUM. *Fetid Ammoniated Alcohol.* Fetid Spirit of Ammonia.

Take of
Ammoniated alcohol, eight ounces,
The gum resin of assa fœtida, half an ounce.

Digest in a close vessel twelve hours; then distil off with the heat of boiling water eight ounces.

This spirit is designed as an anti-hysterick, and is undoubtedly a very elegant one. Volatile spirits, impregnated for these purposes with different fetids, have been usually kept in the shops. The ingredient here chosen, is the best calculated of any for general use, and equivalent in virtue to them all. The spirit is pale when newly distilled, but acquires a considerable tinge by keeping. Its dose is thirty drops.

CHAPTER VIII.

VOLATILE OILS. DISTILLED, OR ESSENTIAL OILS.

VOLATILE oils are prepared nearly in the same manner as the distilled waters, except that less water is to be added. Seeds and woody substances are to be previously bruised or rasped.

The oil comes over with the water, and is afterwards to be separated from it, according as it may be lighter than the water, and swim upon its surface, or heavier, and sink to the bottom. Besides, in preparing both distilled waters and oils, it is to be observed, that the goodness of the subject, its texture, the season of the year, and similar causes, must give rise to so many differences, that no certain or general rule can be given to suit accurately each example.

Therefore, many things are omitted, to be varied by the operator according to his judgment, and only the most general precepts are given.

Volatile oils, medicinally considered, agree in the general qualities of pungency and heat; in particular virtues, they differ as much as the subjects from which they are obtained, the oil being the direct principle in which the

virtues, or at least a considerable part of the virtues of the several subjects reside. Thus the carminative virtue of the warm seeds, the diuretick of juniper berries, the emmenagogue of savin, the nervine of rosemary, the stomachick of mint, the antiscorbutick of scurvy grass, the cordial of aromaticks, &c. are supposed to be concentrated in their oils. The more grateful oils are frequently made use of for reconciling to the stomach medicines of themselves disgustful. Volatile oils are never given alone, on account of their extreme heat and pungency ; which in some is so great, that a single drop let fall upon the tongue, produces a gangrenous eschar. They are readily imbibed by pure dry sugar, and in this form may be conveniently exhibited. Ground with eight or ten times their weight of sugar, they become soluble in aqueous liquors, and thus may be diluted to any assigned degree. Mucilages also render them miscible with water into a uniform milky liquor. They dissolve likewise in spirit of wine ; the more fragrant in an equal weight, and almost all of them in less than four times their own quantity. These solutions may be either taken on sugar, or mixed with syrup, or the like. On mixing them with water, the liquor grows milky, and the oil separates. The more pungent oils are employed externally against paralytick complaints, numbness, pains, aches, cold tumours, and in other cases where particular parts require to be heated or stimulated. The toothache is sometimes relieved by a drop of these almost caustick oils, received on cotton, and cautiously introduced into the hollow tooth. Volatile oils should be kept in small bottles, closely stopped, in a cool place.

Oleum Juniperi Communis. *Oil of Juniper.*

When genuine, this oil has the flavour of the juniper berries, and is soluble in alcohol. It is stimulating, carminative, diaphoretick, and diuretick in doses of ten or fifteen drops. There is generally substituted for it in the shops an oil distilled from some species of turpentine much less grateful, which alcohol does not dissolve.

Oleum Juniperi Sabinæ. *Oil of Savin.*

This plant yields more essential oil than any other does, two pounds affording not less than five ounces. The vir-

tues of the savin seem also to depend on it, as the essential oil is said to be a powerful emmenagogue, in a dose from three to ten drops. In cold phlegmatick habits, it is undoubtedly a medicine of great service.

Oleum Menthæ Piperitæ. *Oil of Peppermint.*

This is one of the most pungent of the essential oils, diffusing almost as soon as taken a glowing warmth through the whole system, and at the same time exciting a peculiar sensation of coolness. In colicks, accompanied with great coldness, and in some hysterick complaints, it is of excellent service. And as a remedy in flatulence, anorexia, and cramps of the stomach, it has often afforded much relief. Two or three drops are in general a sufficient dose. The preparation named essence of peppermint is a solution of one part of the oil in seven parts of alcohol, and coloured by the addition of grass or garden parsley. This is an agreeable and convenient preparation, and is in common use as a carminative in doses of twenty or thirty drops on sugar or in water.

Oleum Pimpinellæ Anisi. *Oil of Anise.*

This oil is of a light colour, and has rather an unpleasant smell. It congeals even at a very moderately cold temperature. It has less pungency than any of the other essential oils, and is therefore well adapted to the purpose to which it is usually applied, that of relieving flatulence and the symptoms arising from it in children. To one ounce of white sugar candy, or refined sugar, add one hundred drops of the best oil of aniseed; having rubbed them together in a marble mortar, let them be well mixed with one ounce of spermaceti in powder. About twenty grains of this compound given in a little milk every three or four hours will be found extremely beneficial in such cases of convulsions in children, prior to the age of dentition, as proceed from acrid irritating humours in the first passages, and having been preceded by gripings, green stools, flatulence, and pain.

Oleum Lavendulæ Spicæ. *Oil of Lavender.*

This is used principally on account of its fine flavour.

Oleum Carui. *Oil of Caraway.*

This is one of the most grateful of the essential oils, and well adapted to act as a carminative, or to communicate an agreeable pungency, and cover the flavour of unpleasant remedies.

Oleum Rorismarini Officinalis. *Oil of Rosemary.*

It is sometimes used in ointments as a perfume, and it enters as a stimulant into the composition of the soap liniment.

Oleum Myrti Pimentæ. *Oil of Pimento.*

It is sometimes used on account of the flavour of pimento, which it possesses.

Oleum Menthæ Viridis. *Oil of Spearmint.*

The flavour of this oil is similar to that of peppermint, rather less grateful, and not so much esteemed. It is sometimes useful in relieving nausea and vomiting.

Oleum Pulegii. *Oil of Pennyroyal.*

This oil may be regarded as superfluous.

Oleum Fœniculi Dulcis. *Oil of Sweet Fennel.*

The flavour of this oil is similar to that of anise.

Oleum Volatile Pini Purissimum. *Purified Volatile Oil of Pine.* Rectified Oil of Turpentine.

Take of

Oil of turpentine, one pound,
Water, four pounds.

Distil as long as any oil comes over.

The oil of turpentine of commerce is obtained by distillation from what is named common turpentine, the juice of the pinus larix, or sometimes from the wood of the tree. It appears to contain a small portion of resinous matter, as when distilled it leaves a little of a thick

residuum, and the distilled oil has been said to be more volatile.

The spirit of turpentine, as this essential oil has been styled, is frequently taken internally as a diuretick and sudorifick, and it has sometimes a considerable effect when taken to the extent of a few drops only. It has, however, been given in much larger doses, especially when mixed with honey. Recourse has principally been had to such doses in cases of chronick rheumatism, particularly in those modifications of it which are termed sciatica, and lumbago; but sometimes they induce bloody urine. Externally it is applied by friction as a stimulant to parts affected with cramp and rheumatism; sometimes too it is used as an application to burns, or as a styptick to bleeding wounds. Mixed with the basilicon ointment it forms the celebrated application for burns recommended by Mr. Kentish. This oil has lately been administered by Dr. I. Brown with complete success in the case of a lad aged sixteen years afflicted for six years with tænia. He swallowed it undiluted in a dose of one ounce, and once in a dose of one and half ounce, and took three doses in sixteen hours. It operated powerfully as a carthartick, and he discharged upwards of twenty feet of the tænia. Dr. Brown is convinced that the rectified oil of turpentine may be taken to the extent of two or three ounces with perfect safety, though he prefers half ounce doses at short intervals. See a confirmation of this practice under pinus larix, in the materia medica.

Oleum Succini Purissimum. *Purified Oil of Amber.*

Distil oil of amber in a glass retort, with six times its quantity of water, till two thirds of the water have passed into the receiver; then separate this very pure volatile oil from the water, and keep it for use in well closed vessels.

The rectified oil has a strong bituminous smell, and a pungent acrid taste. Given in a dose of ten or twelve drops, it heats, stimulates, and promotes the fluid secretions. It is chiefly celebrated in hysterical disorders, and in deficiencies of the uterine purgations. Sometimes it is used externally, in liniments for weak or paralytick limbs and rheumatick pains.

CHAPTER IX.

INFUSIONS AND DECOCTIONS.

Infusion is a term employed in pharmacy, to denote that operation in which water, on remaining for sometime on vegetable matter, dissolves part of it; and also to express the preparation which results from that operation. It is obvious, that infusion, understood in this sense, can be applied with propriety only to those plants whose virtues depend on principles soluble in water. The strength of the infusion is considerably influenced by the temperature of the fluid, hot water dissolving more of the soluble matter than cold; while cold water, from this circumstance, frequently affords a preparation which, if weaker, is more grateful. From dried vegetables, the soluble matter is in general more easily obtained than from those which are recent. Infusions are always extemporaneous preparations, and cannot be preserved in a sound state for more than a few days.

By *boiling* vegetable substances in water, their active matter is more abundantly dissolved than by simple infusion. The preparation thus obtained is termed a *decoction*. In a number of cases, part of the matter dissolved by the assistance of the high temperature separates as the liquor cools, especially where it is of a resinous matter; in others, however, it is retained.

Though a large portion of matter is dissolved by the water in this mode of preparation, yet it cannot be always advantageously employed. Wherever the virtues of the substance subjected to it depend, in whole or in part, on any volatile principle, they are necessarily injured by this being dissipated. At the temperature of 212°, humid extractive matter combines too with oxygen from the atmospherick air; and perhaps at the same temperature, some vegetable principles suffer decomposition from the reaction of their constituent parts: hence many vegetables suffer injury from boiling, even where this cannot be ascribed to the dissipation of their volatile parts. These circumstances limit considerably the application of this form of preparation.

Decoctions are always extemporaneous preparations. In general, during the boiling, the air should be excluded, and the liquor ought to be strained while hot.

INFUSUM CINCHONÆ OFFICINALIS. *Infusion of Cinchona.*

Take of
Bark of cinchona, in coarse powder, one ounce,
Mucilage of gum arabick, two ounces,
Water, one pound.

Triturate the cinchona with the mucilage, and add the water during the trituration. Macerate for twenty-four hours, and decant the pure liquor.

This is a very elegant form of exhibiting the active principles of the Peruvian bark, and that in which it will sit lightest on weak and delicate stomachs. The trituration will promote the solution, and the addition of the mucilage will suspend the finest particles of the substance of the bark itself.

This preparation is used principally in dyspepsia, in a dose of two ounces occasionally.

INFUSUM DIGITALIS PURPUREÆ. *Infusion of Common Foxglove.*

Take of
Dried leaves of common foxglove, one drachm,
Boiling water, eight ounces,
Spirit of cinnamon, one ounce.

Macerate for four hours, and filtrate.

Infusion is the form under which Dr. Withering, who introduced the use of digitalis in dropsy, recommended it to be given. The dose is half an ounce, taken twice a day, and gradually increased till the effects of the remedy appear. The spirit of cinnamon is added to improve its flavour, and to counteract its sedative effects.

INFUSUM GENTIANÆ COMPOSITUM. *Compound Infusion of Gentian.* Bitter Infusion.

Take of
Root of gentian sliced, half an ounce,
Rind of Seville oranges dried and bruised, one drachm,
Coriander seeds bruised, half a drachm,
Diluted alcohol, four ounces,
Water, one pound.

First pour on the alcohol, and three hours after add the water; then macerate without heat for twelve hours, and strain.

This infusion is an extremely good bitter, and is of great service in dyspepsia, and in all cases where bitters in general are necessary. It strengthens the stomach, and increases the appetite; besides acting as a tonick on the other parts of the body, and on the vascular system. The alcohol is a useful addition, both in promoting the extraction of the virtues of all the ingredients, and in preserving the infusion longer from spoiling. Its dose is two ounces occasionally.

Infusum Mimosæ Catechu. *Infusion of Catechu.* Japonick Infusion.

Take of

Extract of catechu in powder, two drachms and a half,
Bark of cinnamon bruised, half a drachm,
Boiling water, seven ounces,
Simple syrup, one ounce.

Macerate the extract and cinnamon in the hot water, in a covered vessel, for two hours; then strain it and add the syrup.

The extract of catechu is completely soluble in water. This preparation, therefore, formerly called Japonick infusion, possesses all its virtues uninjured, and rendered more grateful by the addition of the cinnamon. It is a powerful astringent solution. Its principal use is in diarrhœa. Dose one ounce every third or fourth hour.

Infusum Rhei Palmati. *Infusion of Rhubarb.*

Take of

Root of rhubarb, bruised, half an ounce,
Boiling water, eight ounces,
Spirit of cinnamon, one ounce.

Macerate the rhubarb in a close vessel with the water for twelve hours; then, having added the spirit, strain the liquor.

This appears to be one of the best preparations of rhubarb, when designed as a purgative; water extracting its virtue more effectually than either vinous or spirituous menstrua. The infusion of rhubarb is supposed to have

more of the purgative than of the astringent power. It is accordingly used as a mild cathartick. Dose two ounces.

INFUSUM ROSÆ GALLICÆ. *Infusion of Roses.* Formerly Tincture of Roses.

Take of
Petals of red roses, dried, two ounces,
Boiling water, five pounds,
Sulphurick acid, one drachm,
Double refined sugar, two ounces.

Macerate the petals with the boiling water in an earthen vessel, which is not glazed with lead, for four hours; then having poured on the acid, strain the liquor and add the sugar.

The rose leaves have very little effect, except in giving the mixture an elegant red colour. Its sub-acid and astringent virtues depend entirely on the sulphurick acid. Altogether, however, it is an elegant medicine, and forms a very grateful addition to juleps in hæmorrhagies, and in all cases which require mild coolers and sub-astringents. It is sometimes taken with boluses or electuaries of the bark, and likewise makes a good gargle in cases of cynanche.

INFUSUM TAMARINDI ET SENNÆ. *Infusion of Tamarinds and Senna.*

Take of
Preserved tamarinds, one ounce,
Leaves of senna, one drachm,
Coriander seeds bruised, half a drachm,
Brown sugar, half an ounce,
Boiling water, eight ounces.

Macerate them for four hours, occasionally agitating them in a close earthen vessel, not glazed with lead, and strain the liquor.

It may also be made with double, triple, &c. the quantity of senna.

This combination affords a very pleasant purgative, mild in its operation. The whole quantity may be taken at intervals as a dose. The taste of the senna is well covered by the aromatick, sugar, and by the acidity of the tamarinds. It is excellently suited for delicate stomachs, and inflammatory diseases. Ginger may be used instead of coriander seeds.

DECOCTUM ALTHÆÆ OFFICINALIS. *Decoction of Marsh-Mallow.*

Take of

Root of marsh-mallow, dried and bruised, four ounces,
Raisins stoned, two ounces,
Water, seven pounds.

Boil to five pounds; place apart the strained liquor till the feces have subsided, then pour off the clear liquor.

Marsh-mallow roots contain nothing soluble in water, except mucilage, which is very abundant in them. This decoction is therefore to be considered merely as an emollient, rendered more pleasant by the acidulous sweetness of the raisins.

DECOCTUM CINCHONÆ OFFICINALIS. *Decoction of Cinchona.*

Take of

Bark of cinchona in powder, one ounce,
Water, a pound and a half.

Boil for ten minutes in a covered vessel, and strain the liquor while hot.

Peruvian bark readily yields its active principles to the action of boiling water, and in greater quantity than cold water is capable of retaining dissolved; therefore, when a saturated decoction cools, it becomes turbid, and there is always a deposition of a yellowish or reddish powder; while the supernatant liquor is reduced to the strength of a saturated cold infusion. Decoction, therefore, presents us with an easy means of obtaining immediately an active preparation of cinchona bark, and one of greater strength than a cold or even a warm infusion, provided it be drunk while tepid, and before it forms any deposition, or if the precipitate be diffused by agitation, after it is formed.

Formerly it was supposed that the strength of a decoction of cinchona bark, and similar substances, was increased by continuing the boiling for a great length of time, but this is now known to be a mistake; and, indeed, after a certain time, the decoction becomes weaker instead of stronger, because water at different tempera-

tures is capable of dissolving only a determinate proportion of their active principles; and, therefore, as soon as it is saturated, any further decoction is unnecessary. But moreover, these principles, when dissolved in water, are liable to be decomposed and become inert, by the absorption of atmospherick oxygen; and their decomposition is increased by increase of temperature; and as boiling constantly presents new surfaces to the action of the air, it is evidently hurtful when protracted longer than what is just necessary to saturate the water. Ten minutes is supposed by the colleges to be sufficient for that purpose. This decoction is given in general when bark in considerable doses is requisite, and where the powder does not remain on the stomach. The dose is two ounces repeated occasionally.

DECOCTUM DAPHNES MEZEREI. *Decoction of Mezereon.*

Take of
Bark of the root of mezereon, two drachms,
Root of liquorice bruised, half an ounce,
Water, three pounds.

Boil with a gentle heat to two pounds, and strain.

The use of the liquorice is to cover the pungency of the mezereon. The decoction is given in a dose of six or eight ounces, three or four times a day, in the cases in which mezereon is employed, principally in the secondary symptoms of syphilis, and in rheumatick affections. It operates chiefly by perspiration.

DECOCTUM GUAIACI COMPOSITUM. *Compound Decoction of Guaiacum.* Decoction of the Woods.

Take of
Raspings of the wood of guaiacum, three ounces,
Raisins, two ounces,
Root of sassafras sliced,
Root of liquorice bruised, each one ounce,
Water, ten pounds.

Boil the guaiacum and raisins with the water, over a gentle fire, to the consumption of one half; adding towards the end the sassafras and liquorice. Strain the liquor without expression.

This decoction is of use in some rheumatick and cutaneous affections. It may be taken by itself, to the quantity of a quarter of a pint, two or three times a day, or used as an assistant in a course of mercurial or antimonial alteratives; the patient, in either case, keeping warm, in order to promote the operation of the medicine.

Decoctum Hordei Distichi. *Decoction of Barley.*

Take of
Pearl barley, two ounces,
Water, five pounds.

First wash the barley from the mealy matter that adheres to it, with some cold water; then boil it a little with about half a pound of water, to extract the colouring matter. Throw this away, and put the barley thus purified into five pounds of boiling water; which is to be boiled down to one half, and strained.

This decoction is to be used freely, as a diluting drink in febrile and other acute disorders. However trivial medicines of this class may appear to be, they are of greater importance in the cure of acute diseases than many more elaborate preparations.

Decoctum Polygalæ Senegæ. *Decoction of Seneka.*

Take of
Root of seneka, one ounce,
Water, two pounds.

Boil to sixteen ounces and strain.

The virtues of this decoction will be easily understood from those of the root from which it is prepared. The dose in hydropick cases, and rheumatick or arthritick complaints, is two ounces, three or four times a day, according to its effect. It is given also as an expectorant in pneumonia, and as a stimulant in croup.

Decoctum Smilacis Sarsaparillæ. *Decoction of Sarsaparilla.*

Take of
Root of sarsaparilla sliced, six ounces,
Water, eight pounds.

Macerate for two hours with a heat of about 195°; then take out the root and bruise it; return the bruised root to the liquor, and again macerate it for two hours. Then the liquor being boiled to the measure of four pints, press it out and strain.

Under this form sarsaparilla has been given in the secondary symptoms of syphilis. It is indeed a very doubtful remedy, and its diaphoretick effects are probably owing to its being drunk warm. It is totally incapable of curing syphilis; but by some it is thought useful in the sequelæ of that disease.

CHAPTER X.

EMULSIONS AND MUCILAGES.

Emulsions are preparations in which the expressed oil of seeds or kernels is suspended in water by the medium of the mucilage, and perhaps also of the fecula which the seeds contain. They are always opaque and milky: as the oil is merely diffused through the water, it gradually collects and rises to the surface; and owing to the vegetable matter dissolved in the liquor, they are also liable to become sour. They likewise suffer decomposition from vinous spirits or acids.

Emulsio Amygdali Communis. *Emulsion of Almonds.*
Almond Milk.

Take of
Sweet almonds blanched, one ounce,
Water, two pounds and a half.

Beat the almonds very thoroughly in a stone mortar, gradually pouring on them the water; then strain off the liquor.

This is used merely as a demulcent in catarrh and gonorrhœa, or to obviate strangury during the application of a blister, being drunk *ad libitum*.

Emulsio Camphorata. *Emulsion of Camphor.*

Take of
Camphor, one scruple,
Sweet almonds blanched, two drachms,
Double refined sugar, one drachm,
Water, six ounces.

This is to be made in the same manner as the almond emulsion.

Camphor is less apt to induce nausea when given in liquid than when in a solid form; and this is one of the best forms of preparation. Its dose is two ounces.

Emulsio Ammoniaci. *Emulsion of Ammoniacum.* Ammoniacum Milk.

Take of
Ammoniacum, two drachms,
Water, eight ounces.

Rub the gum-resin with the water, gradually poured on, until it become an emulsion.

In this mixture the resin and oily matter are suspended in the water by the medium of the gum, and a milky, like fluid formed, from which the resin gradually subsides. It is given as an expectorant, in a dose from half an ounce to an ounce at a time.

Mistura Carbonatis Calcis. *Mixture of Carbonate of Lime.* Chalk Mixture.

Take of
Prepared carbonate of lime, one ounce,
Double refined sugar, half an ounce,
Mucilage of gum arabick, two ounces.

Triturate together, and then gradually add of
Water, two pounds and a half,
Spirit of cinnamon, two ounces.

Mix them.

This is a very elegant form of exhibiting chalk, and is a useful remedy in diseases arising from, or accompanied with acidity in the primæ viæ. It is frequently employed in diarrhœa proceeding from that cause. The mucilage

not only serves to keep the chalk uniformly diffused, but also improves its virtues. The dose of this medicine requires no nicety. It may be taken to the extent of a pound or two in the course of a day.

Mucilago Amyli. *Mucilage of Starch.*

Take of
Starch, half an ounce,
Water, one pound.

Triturate the starch, gradually adding the water; then boil them a little.

The mucilage thus formed is very useful in those cases where a glutinous substance is required. It is often successfully employed with opium, as a clyster, in diarrhœa depending on acrimony in the intestines.

Mucilago Astragali Tragacanthæ. *Mucilage of Gum Tragacanth.*

Take of
Gum tragacanth in powder, one ounce,
Boiling water, eight ounces.

Macerate twenty-four hours; then triturate them carefully, that the gum may be dissolved, and press the mucilage through linen cloth.

Gum tragacanth is difficultly soluble in water. When macerated in it, it swells, but does not dissolve. To effect the solution it must be beaten into a paste with some of the water; and the rest of the water must be added gradually, and incorporated with the paste by beating them together. It is used principally in making troches.

Mucilago Mimosæ Niloticæ. *Mucilage of Gum Arabick.*

Take of
Gum arabick in powder, one part,
Boiling water, two parts.

Digest with frequent agitation, until the gum be dissolved; then press the mucilage through linen.

This is the mucilage that is usually employed for pharmaceutick purposes; such as suspending substances insoluble in water, rendering oils miscible with watery liquors, &c. It is also much used for properties peculiar to those substances of its own class; and of all the gums, this seems to be the purest.

CHAPTER XI.

SYRUPS.

Syrups are solutions of sugar in water, either pure, or containing other substances dissolved. They are seldom active medicines, but are principally designed to render others pleasant. The proportion of sugar with which they are generally made, is about two parts to one of fluid.

Syrupus Simplex. *Simple Syrup.*

Take of
Double refined sugar, fifteen parts,
Water, eight parts.

Let the sugar be dissolved in the water by a gentle heat, and boiled a little, so as to form a syrup.

This solution of sugar is used merely to communicate sweetness of taste. It is more convenient in extemporaneous prescription than sugar undissolved.

Syrupus Althææ Officinalis. *Syrup of Marsh-Mallow.*

Take of
Fresh roots of marsh-mallow sliced, one pound,
Water, ten pounds,
Double refined sugar, four pounds.

Boil the water with the roots to the consumption of one half, and strain the liquor, strongly expressing it. Suffer the strained liquor to rest till the feces have subsided; and to the depurated liquor add the sugar; then boil so as to make a syrup.

This is merely a mucilaginous syrup, and is chiefly used in nephritick cases for sweetening emollient decoctions, and in coughs produced by irritation.

Syrupus Amomi Zingiberis. *Syrup of Ginger.*

Take of
Roots of ginger bruised, three ounces,
Boiling water, four pounds,
Double refined sugar, seven pounds and a half.

Macerate the ginger in the water in a close vessel, for twenty-four hours; then to the liquor strained, add the sugar in powder, so as to make a syrup.

This is an agreeable and moderately aromatick syrup, impregnated with the flavour and virtues of the ginger.

SYRUPUS CITRI AURANTII. *Syrup of Orange Peel.*

Take of

The fresh outer rind of Seville oranges, six ounces,
Boiling water, three pounds,
Double refined sugar, four pounds.

Macerate the rind in the water for twelve hours; then add to the filtrated liquor the sugar in powder, and apply a gentle heat, so as to form a syrup.

This syrup is a very elegant and agreeable one, possessing a great share of the fine flavour of the orange peel.

SYRUPUS CITRI MEDICÆ. *Syrup of Lemons.* Syrup of Lemon Juice.

Take of

Juice of lemons, suffered to stand till the feces have subsided, and afterwards strained, three parts,
Double refined sugar, five parts.

Dissolve the sugar in the juice, so as to make a syrup.

This pleasant syrup is used to sweeten and acidulate mixtures, especially those of the mucilaginous kind.

SYRUPUS PAPAVERIS SOMNIFERI. *Syrup of White Poppies.* Diacodium.

Take of

Capsules of white poppy dried, and freed from the seeds, two pounds,
Boiling water, thirty pounds,
Double refined sugar, four pounds.

Macerate the sliced capsules in the water for twelve hours; next boil till only one third part of the liquor remain; then strain it by expressing it strongly. Boil the strained liquor to the consumption of one half, and strain again. Lastly, add the sugar, and boil a little, so as to form a syrup.

This syrup, impregnated with the opiate matter of the poppy heads, is given to children in doses of two or three drachms, to adults, from half an ounce to an ounce, for easing pain, procuring rest, and answering the other intentions of mild opiates. It is uncertain in its strength.

SYRUPUS RHAMNI CATHARTICI. *Syrup of Buckthorn.*

Take of
Juice of ripe buckthorn berries depurated, two parts,
Double refined sugar, one part.

Boil them so as to form a syrup.

This preparation, in doses of three or four spoonfuls, operates as a brisk cathartick. The principal inconveniences attending it are, being very unpleasant, and occasioning a thirst and dryness of the mouth and fauces, and sometimes violent gripes: these effects may be prevented by drinking liberally of water gruel, or other warm liquors, during the operation.

SYRUPUS ROSÆ DAMASCENÆ. *Syrup of Damask Roses.*

Take of
Fresh petals of the damask rose, one pound,
Boiling water, four pounds,
Double refined sugar, three pounds.

Macerate the roses in the water for a night; then to the liquor strained and freed from the dregs, add the sugar; boil them into a syrup.

This syrup is a very mild purgative, and as such, is given to children in a dose of two or three tea spoonfuls.

SYRUPUS ROSÆ GALLICÆ. *Syrup of Red Roses.*

Take of
Dried petals of red roses, seven ounces,
Double refined sugar, six pounds,
Boiling water, five pounds.

Macerate the roses in the water for twelve hours, then boil them a little and strain the liquor; add to it the sugar, and boil them again for a little, so as to form a syrup.

In this preparation the slight astringency of the red rose is supposed to be preserved; and where a syrup having this quality is indicated, this is generally preferred.

SYRUPUS SCILLÆ MARITIMÆ. *Syrup of Squills.*

Take of

Acetous acid with squills, two pounds,
Double refined sugar in powder, three pounds and a half.

Dissolve the sugar with a gentle heat, so as to form a syrup.

This is an active remedy, and is the form under which squill is generally given as an expectorant.

Its dose is one or two drachms. It is also given to children as an emetick, especially in pertussis.

"SYRUPUS SCILLÆ COMPOSITUS. Vulgo *Hive Syrup.*

(From Coxe's Dispensatory.)

"Take of

Seneca root bruised,
Squills, dried and bruised, of each half a pound,
Water, eight pounds.

"Boil together over a slow fire, till the water is half consumed, strain off the liquor, and then add of strained honey, four pounds.

"Boil the honey and the strained liquor to six pounds, or to the consistence of a syrup, and add to every pound of this syrup sixteen grains of tartar emetick; that is, one grain to the ounce.

"The dose varies from ten drops to one or more teaspoons full every quarter, half, or one hour, according to the age of the patient, or the violence of the disease. It operates by purging, vomiting, and sweat.

"Any quantity may be made at a time, using the ingredients in the above proportions.

"From the misfortune of having all my children, five in number, from their birth, subject to attacks of trachitis or the hives, I found it very necessary to turn my particular attention to that disease. All the common remedies, as syrup of squills, decoction of seneka, &c. &c. have been found of little advantage; at length I fell upon the plan of combining the virtues of the remedies most celebrated, into the form of a syrup, which I denominated hive syrup. As I have been frequently asked for it, by those who have in their families experienced its efficacy, I have here given

the receipt, which will enable every one at a trifling expense to prepare it for themselves as a domestick medicine. It is far superiour to every other form of hive syrup I have ever tried, and is equally superiour to them in common colds, hooping cough, and those other complaints for which syrup of squills, &c. are so constantly employed. I may add, that as it sometimes ferments in the hot months, all that is necessary, is merely to boil it down a little, which prevents the continuance of the fermentative process, without diminishing the efficacy of the remedy."

Syrupus Toluiferæ Balsami. *Syrup of Balsam of Tolu.* Balsamick Syrup.

Take of
Simple syrup, two pounds,
Tincture of balsam of tolu, one ounce.

With the syrup recently prepared, and when it has almost grown cold, after it has been removed from the fire, gradually mix the tincture, with constant agitation.

This syrup can be valued only on account of the agreeable flavour of the balsam with which it is moderately impregnated.

Syrupus Violæ Odoratæ. *Syrup of Violets.*

Take of
Flowers of fresh violets, one pound,
Boiling water, four pounds,
Double refined sugar, seven pounds and a half.

Macerate the violets in the water for twenty-four hours in a glass or a glazed earthen vessel, close covered; then strain without expression, and to the strained liquor add the sugar, powdered, and make into a syrup.

This syrup is a very gentle laxative, and as such is given to infants in a dose of one or two tea spoonfuls.

It is apt to lose, in keeping, the elegant blue colour, for which it is chiefly valued.

When pure it forms an excellent test of the presence of acids and alkalis; the former changing it to a red, the latter to a green colour. It is obvious that a prescriber would be deceived if he should expect to give any blue

tinge to acidulated or alkalized juleps or mixtures, by the addition of the blue syrup.

CHAPTER XII.

MEDICATED VINEGARS.

Vinegar is capable of dissolving several of the principles of vegetables. It frequently, however, alters their powers, or does not coincide with them in virtue. There are, therefore, few medicated vinegars in use.

Acetum Aromaticum. *Aromatick Acetous Acid.* Aromatick Vinegar.

Take of
Tops of rosemary dried,
Leaves of sage dried, each four ounces,
Flowers of lavender dried, two ounces,
Cloves in coarse powder, two drachms,
Distilled acetous acid, eight pounds.

Macerate for seven days, express the liquor and filtrate through paper.

From the impregnation of the vinegar with the flavour of these aromatick vegetables, it becomes a grateful perfume, to which purpose chiefly this preparation is applied.

Acetum Scillæ Maritimæ. *Acetous Acid with Squills.* Squill Vinegar.

Take of
Dried root of squills, two ounces,
Distilled acetous acid, two pounds and a half,
Alcohol, three ounces.

Macerate the squills with the acetous acid for seven days; then press out the liquor, to which add the alcohol; and when the feces have subsided, pour off the clear liquor.

A preparation similar to that formerly kept under the name of *oxymel of squills*, may be made by mixing ex-

temporaneously any quantity of honey with the above preparation.

Vinegar is the proper menstruum of squill; and this preparation possesses all its powers unimpaired. It is a very powerful stimulant; and hence it is frequently used, with great success, as a diuretick and expectorant. The dose is from a drachm to half an ounce; where crudities abound in the first passages, it may be given at first in a larger dose, to evacuate them by vomiting. It is most conveniently exhibited along with cinnamon, or other agreeable aromatick waters which prevent the nausea it would otherwise, even in small doses, be apt to occasion.

ACIDUM ACETOSUM CAMPHORATUM. *Camphorated Acetous Acid.*

Take of
Strong acetous acid, six ounces,
Camphor, half an ounce.

Reduce the camphor to powder, by triturating it with a little alcohol; then add it to the acid, in which it should be dissolved.

This solution is a powerful analeptick remedy. Its vapour snuffed up the nostrils, which is the only method of using it, is one of the most pungent stimuli we possess. It is so extremely volatile, that it cannot be preserved without excluding it from the contact of the air; and it is so powerful a menstruum, that it corrodes cork, and almost all common metals, except gold. It should therefore be kept in glass phials, with ground glass stoppers.

CHAPTER XIII.

TINCTURES.

TINCTURES are solutions of vegetable, animal, and sometimes of mineral substances, in spirituous liquors. The solvent may be either pure alcohol, diluted alcohol, or alcohol impregnated with ammonia or ether. They generally contain the virtues of the substances dissolved, in a concentrated state, though sometimes altered, or lost

in those of the menstruum. They are little liable to decomposition, and this gives them a superiority over those preparations in which the solvent power of water is employed. Alcohol is the solvent of a number of the immediate principles of vegetables; of resin, camphor, essential oil, and extract; and hence is capable of extracting the virtues of many important remedies. Tinctures made with it are in general decomposed on the addition of watery liquors.

Diluted alcohol, or proof spirit, is a still more general solvent; as the water it contains dissolves several principles which are not soluble in pure alcohol. It is therefore more generally employed. Alcohol, impregnated with ammonia, or ether, is employed in forming tinctures only of a few substances, whose operations are supposed to be promoted by these agents.

Tinctura Aloes Socotorinæ. *Tincture of Socotorine Aloes.*

Take of
Socotorine aloes in powder, half an ounce,
Extract of liquorice, an ounce and a half,
Alcohol, four ounces,
Water, one pound.

Digest for seven days in a closed vessel, with a gentle heat and frequent agitation; and when the feces have subsided, decant the tincture.

These directions are to be observed in preparing all tinctures.

In this simple tincture, all the active parts of the aloes are suspended in the menstruum. The extract of liquorice serves both to promote the suspension and to cover the taste of the aloes; and in those cases where we wish for the operation of the aloes alone, this is perhaps one of the best formulæ under which it can be exhibited in a fluid state. About an ounce may be taken for a dose.

Tinctura Aloes et Myrrhæ. *Tincture of Aloes and Myrrh.* Elixir Proprietatis.

Take of
Myrrh in powder, two ounces,
Alcohol, one pound and a half,
Water, half a pound.

Mix the alcohol with the water, then add the myrrh; digest for four days; and lastly add of

Socotorine aloes in powder,
Saffron sliced, each two ounces.

Digest again for three days, and pour off the tincture from the sediment.

This may be considered as being the *elixir proprietatis* of Paracelsus, improved with regard to the manner of preparation. It has long been in repute as a warm stimulant and aperient. It strengthens the stomach and other viscera, cleanses the first passages from tenacious phlegm, and promotes the natural secretions in general. Its continued use has frequently done much service in cachectick and icterick cases, uterine obstructions, and other similar disorders; particularly in cold, pale, phlegmatick habits. The dose may be from one drachm to two, twice in a day. This preparation is rendered more pleasant and efficacious by age.

TINCTURA AMOMI REPENTIS. *Tincture of Cardamom.*

Take of
Lesser cardamom seeds bruised, four ounces,
Diluted alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

Tincture of cardamom has been in use for a considerable time. It is a pleasant warm cordial, and may be taken, along with a proper vehicle, in doses of from a drachm to a spoonful or two.

TINCTURA ARISTOLOCHIÆ SERPENTARIÆ. *Tincture of Virginian Snakeroot.*

Take of
Root of Virginian snakeroot bruised, three ounces,
Cochineal in powder, one drachm,
Diluted alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

This tincture, which contains the whole virtues of the root, may be taken to the quantity of a spoonful or more every five or six hours; and to this extent it often operates as a useful diaphoretick.

TINCTURA FERULÆ ASSÆ FŒTIDÆ. *Tincture of Assa Fœtida.* Fetid Tincture.

Take of
Gum-resin of assa fœtida, four ounces,
Alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

This tincture possesses the virtues of the assa fœtida itself; and may be given in doses of from ten drops to fifty or sixty as a remedy in hysteria.

TINCTURA BENZOIN COMPOSITA. *Compound Tincture of Benzoin.* Traumatick Balsam.

Take of
Benzoin in powder, three ounces,
Peruvian balsam, two ounces,
Hepatick aloes in powder, half an ounce,
Alcohol, two pounds.

Digest with a gentle heat for seven days, and filtrate through paper.

This preparation may be considered as an elegant simplification of some very complicated compositions, which were celebrated under different names; such as Wade's balsam, Friar's balsam, Jesuit's drops, &c. These, in general consisted of a confused farrago of discordant substances. They, however, derived considerable activity from the benzoin and aloes; and every thing to be expected from them, may readily be obtained from the present formula.

The compound tincture of benzoin, has been highly recommended, externally, for cleansing and healing wounds and ulcers, for discussing old tumours, allaying gouty, rheumatick, and other old pains and aches; and likewise internally for warming and strengthening the stomach and intestines, expelling flatulences, and relieving colick complaints. Its dose is from thirty to sixty drops. In modern practice it is much less used than formerly.

TINCTURA CAMPHORÆ. *Tincture of Camphor.* Elixir of Camphor.

Take of Camphor, one ounce,
Alcohol, one pound.

Mix them together, that the camphor may be dissolved.

It may also be made with a double or triple proportion of camphor.

This solution of camphor is only employed externally, against rheumatick pains, paralytick numbnesses, for discussing tumours, preventing gangrenes, or restraining their progress. Bruises and strains are also relieved by this application by way of friction to the part.

Tinctura Eleutheriæ. *Tincture of Cascarilla.*

Take of

Bark of cascarilla in powder, four ounces,
Diluted alcohol, two pounds.

Digest with a gentle heat for eight days, and filtrate.

This tincture may be employed to answer most of those purposes for which the bark itself is recommended; but in the cure of intermittents, it in general requires to be exhibited in substance.

Tinctura Angusturæ. *Tincture of Angustura.*

Take of

Bark of angustura in powder, four ounces,
Diluted alcohol, two pounds.

Digest with a gentle heat for eight days, and filtrate.

In cases of dyspepsia this tincture has been found serviceable in doses of one or two drachms.

Tinctura Sennæ Composita. *Compound Tincture of Senna.* Elixir of Health.

Take of

Leaves of senna, three ounces,
Root of jalap bruised, one ounce,
Coriander seeds,
Caraway seeds, each bruised, half an ounce,
Lesser cardamom seeds bruised, two drachms,
Diluted alcohol, three pounds and a half.

Digest for seven days, and to the liquor filtrated through paper add of

Double refined sugar, four ounces.

This tincture is in very common use as a carminative and cathartick, by those especially who have accustomed themselves to the use of spirituous liquors; it oftentimes relieves flatulent complaints and colicks, where the common cordials have little effect. Dose from one to two ounces.

Tinctura Castorei. *Tincture of Castor.*

Take of
Russian castor in powder, an ounce and a half,
Alcohol, one pound.

Digest for seven days, and filtrate through paper.

This is a feeble remedy, given sometimes as an antispasmodick, in a dose of from half a drachm to a drachm.

Tinctura Cinchonæ Officinalis. *Tincture of Cinchona.* Tincture of Bark.

Take of
Red bark of cinchona in powder, six ounces,
Diluted alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

The active matter of bark is entirely extracted by diluted alcohol; but the powers of the menstruum itself do not allow of the use of bark under this form, where large doses of the remedy are necessary. It is used in dyspepsia, occasionally, in a dose of two drachms.

Tinctura Cinchonæ Composita. *Compound Tincture of Cinchona.* Huxham's Tincture.

Take of
Red bark of cinchona in powder, two ounces,
External rind of Seville oranges dried, one ounce and a half,
Root of Virginian snakeroot bruised, three drachms,
Saffron, one drachm,
Cochineal in powder, two scruples,
Diluted alcohol, twenty ounces.

Digest for fourteen days, and filtrate.

This has been for a considerable time celebrated under the title of *Huxham's Tincture of Bark.*

As a corroborant and stomachick, it is given in doses of two or three drachms; but when employed for the cure of intermittents, it must be taken to a greater extent. It is more grateful than the simple tincture, and in dyspeptick affections, it proves a pleasant and efficacious remedy.

Tinctura Colombæ. *Tincture of Colomba.*

Take of

Colomba root in powder, two ounces and a half,
Diluted alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

This is used merely as a bitter tincture in dyspepsia, in a dose of three or four drachms. It may be advantageously employed against bilious vomitings, and those different stomach ailments, in which the colomba has been found useful; but where there does not occur some objection to its use in substance, that form is in general preferable to the tincture.

Tinctura Convolvuli Jalapæ. *Tincture of Jalap.*

Take of

Root of jalap in powder, four ounces,
Diluted alcohol, fifteen ounces.

Digest for seven days, and filtrate through paper.

The activity of jalap resides in its resin, which in this preparation is extracted along with a portion of mucilage.

The tincture may be given as a cathartick, in a dose of four or six drachms.

Tinctura Croci Sativa. *Tincture of Saffron.*

Take of

English saffron sliced, one ounce,
Diluted alcohol, fifteen ounces.

Digest for seven days, and filtrate through paper.

This tincture is to be valued only for its colour.

TINCTURA DIGITALIS PURPUREÆ. *Tincture of Common Foxglove.*

Take of

Dried leaves of common foxglove, one ounce,
Diluted alcohol, eight ounces.

Digest for seven days, and filtrate through paper.

This is a very active preparation; it is the one in which the virtues of digitalis are longest preserved uninjured, and appears to be the best form under which that remedy can be exhibited, to obtain its narcotick effects.

Its dose is ten drops, which, according to the general rules observed in the administration of digitalis, is to be gradually increased. It has been chiefly used to diminish the force of the circulation of the blood in hæmoptysis, and often with remarkable success. It is in this form that digitalis is generally exhibited for the cure of phthisis pulmonalis. The chief advocates for this remedy in England are undoubtedly men of eminence in their profession, some of whom were on its first introduction so extremely sanguine as to imagine that it approximates to a specifick; although such expectations cannot be fully realized, it is evidently a remedy of great efficacy, sometimes effecting a radical cure, and seldom failing to alleviate the most distressing symptoms attending that fatal disease. The attestations and facts adduced in its favour are sufficient to encourage the most persevering trials in every case of incipient phthisis pulmonalis.

TINCTURA GENTIANÆ COMPOSITA. *Compound Tincture of Gentian.* Stomachick Elixir.

Take of

Root of gentian sliced and bruised, two ounces,
Rind of Seville oranges dried and bruised, one ounce,
Bark of canella alba bruised, half an ounce,
Powder of cochineal, half a drachm,
Diluted alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

This is a very elegant spirituous bitter, formerly called *stomachick elixir.* The aromaticks are here very commodious ingredients, as in this spirituous menstruum

they are free from the inconvenience with which they are attended in other liquors, of diminishing their transparency.

This tincture is employed in dyspepsia, in a dose of two or three drachms given occasionally.

TINCTURA GUAJACI OFFICINALIS. *Tincture of Guaiacum.*

Take of

Gum-resin of officinal guaiacum in powder, one pound,
Alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

What is called gum guaiack is in fact a resin, and perfectly soluble in alcohol. This solution is a powerful stimulating sudorifick, and may be given in doses of about half an ounce in rheumatick and arthritick cases.

TINCTURA HELLEBORI NIGRI. *Tincture of Black Hellebore.*

Take of

Root of black hellebore bruised, four ounces,
Cochineal in powder, half a drachm,
Diluted alcohol, two pounds and a half.

Digest seven days, and filtrate through paper.

This is perhaps the best preparation of hellebore, when designed for an alterative, the menstruum here employed extracting the whole of its virtues. It has been found by experience particularly serviceable in uterine obstructions. In sanguine constitutions, where chalybeates are hurtful, it has been said that it seldom fails of exciting the menstrual evacuations, and removing the ill consequences of their suppression. A tea spoonful of the tincture may be taken twice a day in warm water, or some other convenient vehicle.

TINCTURA HYOSCIAMI NIGRI. *Tincture of Black Henbane.*

Take of

Leaves of black henbane dried, one ounce,
Diluted alcohol, eight ounces.

Digest for seven days, and filtrate through paper.

This tincture, although not yet come into general use, is a valuable anodyne, and in many cases may be substituted with advantage for the tincture of opium, especially where the latter produces obstinate constipation; or, instead of its usual soporifick and sedative effects, it causes uneasiness, restlessness, and universal irritation. Its dose is from a scruple to a drachm.

Tinctura Kino. *Tincture of Kino.*

Take of
Kino in powder, two ounces,
Diluted alcohol, a pound and a half.

Digest seven days, and filtrate through paper.

This is certainly a very astringent tincture, and will be found an excellent medicine in obstinate diarrhœa and in lienteria. The dose is from half a drachm to a drachm.

Tinctura Lauri Cinnamomi. *Tincture of Cinnamon.*

Take of
Bark of cinnamon bruised, three ounces,
Diluted alcohol, two pounds and a half.

Digest for seven days and filtrate through paper.

This is used merely as an aromatick and cordial, in doses from one drachm to three.

Tinctura Cinnamomi Composita. *Compound Tincture of Cinnamon.* Aromatick Tincture.*

Take of
Bark of cinnamon,
Lesser cardamom seeds, each bruised, one ounce,
Long pepper in powder, two drachms,
Diluted alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

In this formula, the Dublin and London colleges diminish the quantity of cardamom seeds, and substitute ginger.

* Substitute. *Aromatick Tincture.*—Infuse ℥ii Jamaica pepper in two pints of brandy without heat, a few days; then strain off the tincture.

This makes no alteration on the virtues of the preparation, which is a warm aromatick, too hot to be given without dilution. It was formerly called *aromatick tincture*. A tea spoonful or two may be taken in wine, or any other convenient vehicle, in languors, weakness of the stomach, flatulences, and other similar complaints; and in these cases it is often employed with advantage.

TINCTURA LAVANDULÆ COMPOSITA. *Compound Tincture of Lavender.* Compound Spirit of Lavender.

Take of

Spirit of lavender, three pounds,
..... rosemary, one pound,
Bark of cinnamon bruised, one ounce,
Flower-buds of the clove tree bruised, two drachms,
Nutmeg bruised, half an ounce,
Wood of red saunders rasped, three drachms.

Macerate for seven days, and filtrate.

This is a grateful cordial in common use, as relieving languor and faintness. From ten to one hundred drops may be conveniently taken, dropped upon sugar. It does not appear very clearly whether it should be considered as a spirit or tincture; for although the spirit of lavender be the predominant ingredient, yet the mode of preparation is that of a tincture, and the spirit as a menstruum dissolves astringent colouring, and other substances, which would not rise with it in distillation.

TINCTURA MELOES VESICATORII. *Tincture of Cantharides.*

Take of

Cantharides bruised, one drachm,
Diluted alcohol, one pound.

Digest for seven days, and filtrate through paper.

This tincture contains the active principle of the cantharides, whatever it may be. It is applied externally as a stimulant and rubefacient; and is sometimes given internally, in doses of from ten to twenty drops as a diuretick.

"In dropsical effusions with debility, three or four drachms given in divided doses during the day, will produce a powerful evacuation of urine."

TINCTURA MELOES VESICATORII FORTIOR. *Strong Tincture of Cantharides.*

Take of
Cantharides bruised, ten drachms,
Diluted alcohol, one pound.

Digest for fourteen days, and filtrate through paper. This is intended merely for external application.

TINCTURA MIMOSÆ CATECHU. *Tincture of Catechu.* Japonick Tincture.

Take of
Extract of catechu in powder, three ounces,
Bark of cinnamon bruised, two ounces,
Diluted alcohol, two pounds and a half.

Digest for eight days, and filtrate through paper.

The cinnamon is a very useful addition to the catechu, not only as it warms the stomach, &c. but likewise as it improves the roughness and astringency of the other. This tincture is of service in all kinds of defluxions, catarrhs, loosenesses, uterine fluors, and other disorders, where mild astringent medicines are indicated. Two or three tea spoonfuls may be taken frequently in red wine, or any other proper vehicle.

TINCTURA MURIATIS AMMONIÆ ET FERRI. *Tincture of Muriate of Ammonia and Iron.* Ammoniack Tincture of Iron.

Take of
Muriate of ammonia and iron, four ounces,
Diluted alcohol, sixteen ounces.

Digest and filtrate.

This is seldom prepared, being much less elegant than the following.

TINCTURA MURIATIS FERRI. *Tincture of Muriate of Iron.* Tincture of Iron.

Take of
Carbonate of iron, half a pound,
Muriatick acid, three pounds,
Alcohol, three pounds and four ounces.

Pour the muriatick acid on the carbonate of iron in a glass vessel; and shake the mixture now and then, during three days. Set it by, that the feces may subside; then pour off the liquor; evaporate this to sixteen ounces; and when cold, add to it the alcohol.

The black oxide of iron combines with the muriatick acid, and, during the solution, acquires more oxygen, partly by absorption from the atmosphere, and partly by decomposition of the water, which is promoted by the heat applied. The muriate of iron, in which this more perfect oxide is contained, is soluble in alcohol. The present preparation is such a tincture diluted with the water of the muriatick acid. When first prepared, it contains a portion of muriate of iron, in which the metal is imperfectly oxidated; but this soon attracts more oxygen; and hence, the colour of the tincture deepens on keeping. It is a very active and excellent chalybeate, and may be given in doses of ten or twenty drops, twice or thrice a day, in any proper vehicle.

The muriated tincture of iron is a remedy which often proves extremely efficacious in suppressions of urine arising from spasm, if given in doses of ten drops, and repeated every ten minutes until some sensible effect is produced, it will seldom fail of removing the spasm; and after six doses the urine usually flows freely.

Tinctura Myrrhæ. *Tincture of Myrrh.*

Take of
Myrrh in powder, three ounces,
Alcohol, twenty ounces,
Water, ten ounces.

Digest for seven days, and filtrate through paper.

Tincture of myrrh is recommended internally for warming the habit, attenuating viscid juices, strengthening the solids, opening obstructions, particularly those of the uterine vessels, and resisting putrefaction. The dose is from fifteen to forty drops, or more. It may perhaps be given in these cases to advantage; though it is more commonly used externally as a stimulant and antiseptick application for cleansing foul ulcers, and promoting the exfoliation of carious bones.

TINCTURA OPII. *Tincture of Opium. Thebaick Tincture.* Liquid Laudanum.

Take of
Opium, two ounces,
Diluted alcohol, two pounds.

Digest seven days, and filtrate through paper.

This tincture is the most usual form under which opium is administered, having long been known under the name of *liquid laudanum.*

The proportion of opium to the solvent is five grains to the drachm; but by evaporation it is found that one drachm of the tincture holds three grains and a half dissolved. The usual dose is twenty-five drops. It is to be regretted that this tincture is not so well adapted for keeping as could be wished; in long standing a part of the opium is gradually deposited, and consequently the tincture becomes weaker; the part which thus separates amounts sometimes, as it is said, to near one fourth of the quantity of opium at first dissolved.

The occasions for the use of laudanum in families are so numerous, that the utmost certainty with regard to the uniformity of the strength, and the dose, ought to prevail. According to the London college, ten drachms of opium go to one pint of proof spirit. Dr. Donald Monroe observes, one drachm (sixty drops,) of such tincture, contains, by experiment, three and two thirds grains of opium; so that three drachms of it contains eleven grains: hence if we mix eight drachms of proof spirit, with three drachms of the above tincture, we form a tincture, each drachm of which contains one grain of opium; if we want a still weaker preparation, we may add eleven drachms more of *spirit*, when we shall have a tincture, each drachm of which contains half a grain of opium. In most cases, however, it is advisable to administer *laudanum* in small quantities, (say fifteen drops to a grown person,) at a time, until the desired effect be produced. A single full dose of twenty, thirty, or thirty-five drops, will frequently disappoint our wishes, by proving either too great, or too small a quantity for the necessities of the system. *Laudanum* should always be given in a perfectly pure state: that which has by long keeping deposited a portion of the opium

previously held in solution, and thereby become thick, and strong, should be marked, and reserved for external application.

TINCTURA OPII CAMPHORATA. *Camphorated Tincture of Opium.* Paregorick Elixir.

Take of
Opium,
Benzoick acid, of each one drachm,
Camphor, two scruples,
Volatile oil of aniseed, one drachm,
Diluted alcohol, two pounds.

Digest for ten days, and filtrate through paper.

In this formula the virtues of the opium and camphor are combined. It gets an agreeable flavour from the acid of benzoin, and the essential oil. The latter will also render it more stimulating; but whether it derives any salutary virtues from the former, we do not know. It was originally prescribed under the title of elixir asthmaticum, which it does not ill deserve. It tends to allay the tickling which provokes frequent coughing, and, at the same time, it is supposed to open the breast, and give greater liberty of breathing. It is given to children against the chin cough, &c. from five to twenty drops; to adults, from twenty to a hundred. Half an ounce, by measure, contains about a grain of opium.

TINCTURA RHEI PALMATI. *Tincture of Rhubarb.*

Take of
Root of rhubarb in coarse powder, three ounces,
Lesser cardamom seeds bruised, half an ounce,
Diluted alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

This tincture contains all the virtues of rhubarb. Its dose is from half an ounce to an ounce.

TINCTURA RHEI ET ALOES. *Tincture of Rhubarb and Aloes.* Sacred Elixir.

Take of
Root of rhubarb in coarse powder, two drachms,
Socotorine aloes in powder, six drachms,
Lesser cardamom seeds bruised, half an ounce,
Diluted alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

TINCTURA RHEI ET GENTIANÆ. *Tincture of Rhubarb and Gentian.* Bitter Tincture of Rhubarb.

Take of
Root of rhubarb in coarse powder, two ounces,
Root of gentian sliced and bruised, half an ounce,
Diluted alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

TINCTURA RHEI DULCIS. *Sweet Tincture of Rhubarb.*

Take of
Root of rhubarb in coarse powder, two ounces,
Root of liquorice bruised,
Anise seeds bruised, each one ounce,
Double refined sugar in powder, two ounces,
Diluted alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

All the foregoing tinctures of rhubarb are designed as stomachicks and corroborants, as well as purgatives; spirituous liquors excellently extract those parts of the rhubarb in which the two first qualities reside; and the additional ingredients considerably promote their efficacy. In weakness of the stomach, indigestion, laxity of the intestines, diarrhœas, colick, and other similar complaints, these medicines are frequently of great service. The sacred elixir has been much employed as a warming cordial purge, and for the general purposes of alocticks, with which, however, it combines the medical properties of rhubarb.

A spoonful or two may be taken for a dose, and occasionally repeated.

TINCTURA SAPONIS. *Tincture of Soap.* Saponaceous Liniment. Opodeldock.

Take of
Soap in shavings, four ounces,
Camphor, two ounces,
Volatile oil of rosemary, half an ounce,
Alcohol, two pounds.

Digest the soap in the alcohol for three days; then add to the filtrated liquor, the camphor and oil, agitating them diligently.

TINCTURA SAPONIS ET OPII. *Tincture of Soap and Opium.* Anodyne Balsam.

This is prepared in the same way and from the same substances as the tincture of soap, but with the addition from the beginning of one ounce of opium.

These tinctures are used externally as powerful stimulant applications in strains and rheumatick pains. The latter long known under the title of *anodyne balsam*, possesses great efficacy in removing local pains, especially if a tea spoonful be at the same time taken internally.

TINCTURA SCILLÆ MARITIMÆ. *Tincture of Squill.*

Take of
Root of squills fresh dried and bruised, four ounces,
Diluted alcohol, two pounds.

Digest for eight days, and pour off the liquor.

As vinegar best covers the nauseous taste of squill, it is generally used as its menstruum. This tincture contains, however, the active matter of this, and may be given in a dose of from twenty to sixty drops.

TINCTURA TOLUIFERÆ BALSAMI. *Tincture of Balsam of Tolu.*

Take of
Balsam of tolu, an ounce and a half,
Alcohol, one pound.

Digest until the balsam be dissolved, and then filtrate the tincture through paper.

This solution of balsam of tolu possesses all the virtues of the balsam itself. It may be taken internally, with the several intentions for which that valuable balsam is proper, to the quantity of a tea spoonful or two, in any convenient vehicle. Mixed with the plain syrup of sugar, it forms an elegant balsamick syrup.

Tinctura Veratri Albi. *Tincture of White Hellebore.*

Take of

Root of white hellebore bruised, eight ounces,
Diluted alcohol, two pounds and a half.

Digest for seven days, and filtrate through paper.

This tincture has seldom been employed, and is now altogether superseded by the vinous tincture of the same root mentioned under veratrum album in the materia medica.

Tinctura Humuli. *Tincture of Hop.*

Take of

Hops, five ounces,
Proof spirit, two pints,

Macerate for fourteen days, and strain.

Hop having been introduced as a narcotick, the tincture affords a convenient form for its administration. It has been supposed to be nearly of the same strength as tincture of opium, but it requires in general to be given in a dose of from half a drachm to a drachm, to produce much sensible effect.

TINCTURES MADE WITH ETHERIAL SPIRITS.

We have classed these tinctures by themselves, because they are more strongly characterized by the nature of the menstruum, than of the substances dissolved in it. Indeed, the etherial spirits are used in these instances, not to dissolve bodies which would resist the action of the alcohol and water, but for the sake of their own direct action on the body.

Tinctura Aloes Ætherea. *Etherial Tincture of Aloes.* Vitriolick Elixir Proprietatis.

Take of

Gum-resin of socotorine aloes,
Myrrh, of each in powder an ounce and a half,
English saffron sliced, one ounce,
Sulphurick ether with alcohol, one pound.

Digest the myrrh with the liquor for four days in a close vessel, then add the saffron and aloes.

Digest again for four days, and when the feces have subsided, pour off the tincture.

By first digesting the myrrh with the spirit, a sufficient quantity of it is dissolved, which would not be, were the aloes added to it; and, by the second digestion, a sufficient quantity of the latter is taken up. The formula is the improvement of one which has long kept its place in the different pharmacopœias. It agrees generally in its effects, with the other tinctures of aloes, the only difference arising from the more penetrating and stimulating nature of the menstruum itself. As a purgative, it is given in doses of one or two drachms.

Æther Sulphuricus cum Alcohole Aromaticus. *Aromatick Sulphurick Ether with Alcohol.*

This is made of the same aromaticks, and in the same manner as the compound tincture of cinnamon; except that in place of the alcohol, sulphurick ether with alcohol is employed.

The additions to the sulphurick ether in this formula, are of so little importance, that the preparation is scarcely ever used.

Acidum Sulphuricum Aromaticum. *Aromatick Sulphurick Acid.* Acid Elixir of Vitriol.*

Take of

Alcohol, two pounds,
Sulphurick acid, six ounces.

* Substitute. *Elixir Vitriol.*—Take of aromatick tincture (page 549) one pint, sulphurick acid, three ounces. Mix them gradually, and after the feces have subsided, filter the elixir through paper in a glass funnel.

Drop the acid gradually into the alcohol.

Digest the mixture with a very gentle heat in a close vessel for three days, and then add of

Bark of cinnamon bruised, an ounce and a half,
Root of ginger bruised, one ounce.

Digest again in a close vessel for six days, and then filtrate the tincture through paper placed in a glass funnel.

This is a valuable medicine in weakness and relaxation of the stomach, and decays of the constitution, particularly in those which proceed from irregularities, which are accompanied with slow febrile symptoms, or which follow the suppression of intermittents. It frequently succeeds, after bitters and aromaticks, by themselves, had availed nothing; and, indeed, great part of its virtues depend on the sulphurick acid, which, barely diluted with water, has, in cases where the stomach could bear acidity, produced happy effects. It is very usefully conjoined with cinchona, and other tonick barks, both as covering their disagreeable taste, and as coinciding with them in virtue. It may be given in doses of from ten to thirty drops, or more, several times a day.

AMMONIATED OR VOLATILE TINCTURES.

Alcohol Ammoniatum Aromaticum. *Aromatick Ammoniated Alcohol.*

Take of

Ammoniated alcohol, eight ounces,
Volatile oil of rosemary, one drachm and a half,
Volatile oil of lemon peel, one drachm.

Mix them, that the oils may be dissolved.

By this combination of the ammonia with the alcohol, and the addition of the aromatick oils, it is rendered more grateful than the water of ammonia. This preparation is therefore sometimes used in preference to the other, as a stimulating perfume, and even for internal exhibition. Dose from fifteen to thirty drops.

TINCTURA CASTOREI COMPOSITA. *Compound Tincture of Castor.*

Take of
Russian castor in powder, one ounce,
Gum-resin of assa fœtida, half an ounce,
Ammoniated alcohol, one pound.

Digest for seven days in a close stopped phial, and filtrate through paper.

This composition is a medicine of real efficacy, particularly in hysterical disorders, and the several symptoms which accompany them. The spirit here used is an excellent menstruum, both for the castor and the assa fœtida, and greatly adds to their virtues. The dose is from half a drachm, to one drachm.

TINCTURA GUAJACI AMMONIATA. *Ammoniated Tincture of Guaiacum.* Volatile Elixir of Guaiacum.

Take of
Gum-resin of officinal guaiacum, four ounces,
Ammoniated alcohol, one pound and a half.

Digest for seven days, and filtrate through paper.

This is a very elegant and efficacious tincture; the ammoniated spirit readily dissolving the resin, and at the same time promoting its medicinal virtue. In rheumatick cases, a tea or even table spoonful, taken every morning and evening, in any convenient vehicle, particularly in milk, has proved of singular service.

Or it may be prepared as follows:

Take of
Gum guaiacum, eight ounces,
Pimento in powder, two ounces,
Sub-carbonate of potass, two drachms,
Alcohol diluted, two pounds.

Digest for seven days, and filtrate through paper.

To four ounces of this tincture add ammoniated alcohol one ounce, more or less, as the case may require.

TINCTURA OPII AMMONIATA. *Ammoniated Tincture of Opium.*

Take of
Benzoick acid,
English saffron, sliced, each three drachms,
Opium, two drachms,
Volatile oil of anise seeds, half a drachm,
Ammoniated alcohol, sixteen ounces.

Digest for seven days in a close vessel, and filtrate through paper.

This is a preparation of considerable efficacy in many spasmodick diseases, as chincough, &c. the ammonia removing the spasm immediately, while the opium tends to prevent its return. Each drachm contains about a grain of opium under the name of *paregorick elixir*. This preparation has been highly esteemed in catarrhal affections, and other complaints of the breast. Its dose is from half a drachm to a drachm.

TINCTURA DATURA STRAMONIUM. *Tincture of Thorn Apple.*

Take of
Leaves of thorn apple dried, one ounce,
Proof spirit, eight ounces.

Digest for seven days, and strain through paper.

This is a convenient form for administering the stramonium, especially to children. The proper dose may be ascertained by its effects, beginning with a few drops, and increasing gradually in the same manner as the extract.

TINCTURA CONIUM MACULATUM. *Tincture of Hemlock.*

Take of
Dried leaves of hemlock, one ounce,
Proof spirit, eight ounces.

Digest for seven days, and strain through paper.

This is a very active preparation, and will probably answer all the purposes expected from cicuta in any form. It is to be exhibited in doses from thirty to sixty drops, and gradually increased in the same manner as the extract, until the effect become evident.

TINCTURA SANGUINARIA CANADENSIS. *Tincture of Blood Root.*

Take of

Blood root coarsely powdered, two ounces,
Proof spirit, one pound.

Digest seven days, and filter through paper.

This medicine has recently been found to be a valuable substitute for digitalis, in the cure of coughs and pulmonick complaints. It appears to possess the same power of diminishing the frequency of the pulse as the digitalis, when exhibited with the same precautions; and is equally efficacious, and less apt to induce debility and dangerous consequences. The proper dose of the tincture is from thirty to eighty drops twice in the day, increasing or decreasing the number as particular circumstances may seem to require.

TINCTURA LOBELIA INFLATA. *Tincture of Indian Tobacco.*

Take of

Leaves and seeds of lobelia inflata, two ounces,
Proof spirit, one pint.

Digest seven days, and filter through paper.

The dose of this tincture is from a tea spoonful to a table spoonful, in asthma, cough with difficult respiration from tenacious phlegm oppressing the bronchial vessels, and in croup and hooping cough. [See lobelia inflata in the materia medica.]

TINCTURA EUPATORIUM PERFOLIATUM. *Tincture of Thoroughwort.*

Take of

The dried leaves and flowers of thoroughwort, four ounces,
Orange peel bruised, one ounce,
Cochineal, half a drachm,
Proof spirit, three pints.

Digest for seven days, and filter through flannel.

This forms an elegant and efficacious stomachick bitter. It may be employed with great advantage in dyspepsia,

and in most cases of debility of the stomach and impaired state of the digestive powers.

CHAPTER XIV.

MEDICATED WINES.

Wine, from its composition, and especially from the alcohol and water it contains, is capable of dissolving the active matter of many vegetables. Solutions of this kind are named *medicated wines*. They are more liable to decomposition from keeping than tinctures. To obviate this, it is usual to add to them, when prepared, a portion of alcohol.

Vinum Aloes Socotorinæ. *Wine of Socotorine Aloes.* Sacred Tincture.

Take of
Gum-resin of socotorine aloes in powder, one ounce,
Lesser cardamom seeds bruised,
Root of ginger bruised, each one drachm,
Spanish white wine, two pounds.

Digest for seven days, stirring now and then, and afterwards filtrate.

This medicine has long been in great esteem, not only as a cathartick, but likewise as a stimulus. It appears, from long experience, to be a medicine of great utility. The dose, as a purgative, is from one to two ounces. It may be introduced into the habit, so as to be productive of excellent effects as an alterant, by giving it in small doses, at proper intervals; thus managed, it does not for a considerable time operate remarkably by stool; but at length proves purgative, and occasions a lax habit of much longer continuance, than that produced by other catharticks.

Vinum Ferri. *Wine of Iron.* Chalybeate Wine.

Take of
Purified filings of iron, one ounce,
Spanish white wine, sixteen ounces.

Digest for a month, often shaking the vessel, and then filtrate.

This is merely a solution of tartarized iron in wine; for the iron is only dissolved in the wine by means of the supertartrite of potass it contains. But a solution of a known proportion of tartarized iron in wine, will give a medicine of more equal powers, and may be made extemporaneously. The dose is from a drachm to half an ounce, twice or thrice a day in chlorotick cases.

Vinum Gentianæ Compositum. *Compound Wine of Gentian.* Bitter Wine.

Take of

Root of gentian sliced and bruised, half an ounce,
Red bark of cinchona in powder, one ounce,
External rind of Seville oranges, dried and bruised, two drachms,
Bark of canella alba in powder, one drachm,
Diluted alcohol, four ounces,
Spanish white wine, two pounds and a half.

First, pour on the diluted alcohol, and after twenty-four hours, add the wine; then macerate for seven days, and filtrate.

This wine is intended to supply the place of the *Vinum Amarum*, as it was formerly called.

Wine is fully capable of extracting the active powers of the different ingredients; and it supplies us with a very useful and elegant stomachick medicine. Its dose is six drachms.

Vinum Ipecacuanhæ. *Wine of Ipecacuan.*

Take of

Root of ipecacuan in powder, one ounce,
Spanish white wine, fifteen ounces.

Macerate for seven days, and filtrate through paper.

This medicated wine is preferable to a tincture of ipecacuan, as being less pungent, while it holds the active matter of the root fully dissolved. Its dose, as an emetick, is one ounce to an adult.

Vinum Nicotianæ Tabaci. *Wine of Tobacco.*

Take of

Dried leaves of tobacco sliced, one ounce,
Spanish white wine, one pound.

Macerate for seven days, and filtrate through paper.

We have already, under the article *nicotiana* in the materia medica, offered some observations upon its introduction into practice by Dr. Fowler, as a very useful remedy in the cure of dropsies and dysuries. From his treatise on that subject, the present formula is taken; and we may observe, that while in practice, we have frequently experienced from tobacco those good effects, for which Dr. Fowler recommends it, we are inclined to give the present formula the preference to every other which he has proposed.

Dose, thirty drops, gradually increased to sixty or eighty, twice a day.

Vinum Opii Compositum. *Compound Wine of Opium.* Thebaick Tincture.

Take of

Opium, two ounces,
Flower buds of the clove tree bruised,
Cinnamon bruised, each one drachm,
Spanish white wine, sixteen ounces.

Macerate for seven days, and filtrate through paper.

This is the *liquid laudanum* of Sydenham, with the exchange of Canary wine for mountain, and the omission of an ounce of saffron; and was the tinctura thebaica, or liquid laudanum, of the London pharmacopœia. The aromaticks here directed are in so small quantity, that no considerable effect can be expected from them, the proportion of each that goes to a grain of opium amounting to no more than the sixteenth part of a grain. Even the minute proportions, however, are in a good measure sufficient to take off the ill odour of the opium, which seems to be all that is intended by them.

The principal advantages of exhibiting opium in this form are, that by being already dissolved, it exerts itself sooner in the body, and that by some persons, liquids are more commodiously taken, than a bolus or pill. The

common doses of the tincture are from *ten drops to forty, fifty, or more*, according to the exigencies of the case. It is to be wished that the dose could be more exactly ascertained, by weight or measure; as the drops may, according to different circumstances, vary in quantity, though in number the same; and as an errour therein may, in some cases, be of mischievous consequences. *Twenty drops contain, at a medium, about one grain of opium*, or rather so much as that quantity of wine will extract from one grain; for the liquor does not dissolve the whole substance of the opium, nor is the solution equivalent, in its effect, to the full quantity of opium employed in it.

A liquid opiate, free from the inconveniences here complained of, may be found under the head of tinctures, page 553.

Vinum Rhei Palmati. *Wine of Rhubarb.*

Take of

Root of rhubarb sliced, two ounces,
Bark of canella alba bruised, one drachm,
Diluted alcohol, two ounces,
Spanish white wine, fifteen ounces.

Macerate for seven days, and filtrate through paper.

This is a warm, cordial, laxative medicine. It is used chiefly in weakness of the stomach and bowels, and some kinds of loosenesses, for evacuating the offending matter, and strengthening the tone of the viscera. Its dose as a purgative is from half an ounce to an ounce.

Vinum Tartitris Antimonii. *Wine of Tartrite of Antimony.* Antimonial Wine.

Take of

Tartrite of antimony, twenty-four grains,
Spanish white wine, one pound.

Mix them so that the tartrite of antimony may be dissolved.

Tartrite of antimony dissolved in wine, can be preserved longer without decomposition than when dissolved in water; but, even on long keeping, part of the antimonial oxide is deposited. In its employment and effects, the vinous solution of tartar emetick does not differ from one made with water. It is given as an emetick in the dose of

one ounce; as a diaphoretick, in a much smaller dose. It contains two grains of tartrite of antimony in the ounce, but it is not of sufficient strength. The formula directed by the London and Dublin colleges, containing four grains in the ounce, will be found more convenient in practice.

In the old formula for the preparation of *antimonial wine*, vitrified (glass) of antimony was directed to be used; but as the tartarous acid contained in the wine acts on the oxide of antimony, and renders part of it soluble, the quantity must be uncertain, and the wine cannot be uniform in strength. The preparation, therefore, ought to be entirely rejected, since its strength cannot be known.

VINUM ANTIMONII TARTARIZATI. *Wine of Tartarized Antimony.*

Take of

Tartarized antimony, two scruples,
Boiling distilled water, four fluidounces,
Wine six fluidounces.

Dissolve the tartarized antimony in the boiling distilled water; then add the wine. It will be perceived that this formula of the London and Dublin colleges, contains four grains of tartarized antimony to the ounce, being double the quantity of that of the Edinburgh college. As this is adopted in our pharmacopœia, we shall no longer have occasion to complain of a want of uniformity of strength in this preparation. This proportion will now prevail as the uniform standard throughout the United States.

CHAPTER XV.

EXTRACTS.

EXTRACTS MADE WITH WATER.

WHEN vegetable matter is dissolved in water or alcohol, by evaporation of the solvent, a concrete tenacious mass is obtained, termed an extract. When prepared from an aqueous solution, it is named a watery, when from one in alcohol, pure or diluted, a spirituous extract. The former must consist chiefly of those proximate principles

which water can easily dissolve; mucilage, tannin, extractive, and saline matter; the latter, of a portion of these with resin.

In either preparation, the volatile principles must necessarily be dissipated; and in many cases, especially in the preparation of the watery extracts, decomposition or oxygenation of the more fixed parts take place. Hence there are few vegetables whose virtues are obtained uninjured in their extracts. Water is the menstruum most economically employed in making extracts, as it is capable of dissolving all the active principles except resin, and can have its solvent powers assisted by a considerable degree of heat.

It is indifferent, with regard to the medicine, whether the subject be used fresh or dry, since nothing that can be preserved in this process, will be lost by drying.

The evaporation is most conveniently performed in large, shallow vessels; the larger the surface of the liquor, the sooner will the aqueous parts exhale. It is necessary to keep a constant stirring toward the end of the process, in order to prevent an empyreuma, and that the extracts may be of a uniform consistence, and free of clots.

EXTRACTUM GENTIANÆ LUTEÆ. *Extract of Gentian.*

Take of

Root of gentian, any quantity.

Having cut and bruised it, pour upon it eight times its quantity of water. Boil to the consumption of one half of the liquor, and strain it by strong expression. Evaporate the decoction immediately to the consistence of thick honey, in a bath of water saturated with muriate of soda.

This extract is intensely bitter. It is generally used to form other medicines into pills, particularly those with which it coincides in medicinal virtues, as tonicks and emmenagogues.

In the same manner are prepared

From the roots of	
Liquorice,	*Extractum glycyrrhizæ glabræ.* Extract of liquorice.
Black hellebore,	*Extractum hellebori nigri.* Extract of black hellebore.

From the inner bark of
Butternut, *Extractum juglandis cinereæ.*
Extract of butternut.

From the leaves of
Rue, *Extractum rutæ graveolentis.*
Extract of rue.

Senna, *Extractum cassiæ sennæ.*
Extract of senna.

From the flowers of
Chamomile, *Extractum anthemidis nobilis.*
Extract of chamomile.

From the capsules of
White poppy, *Extractum papaveris somniferi.*
Extract of white poppy.

From the wood of
Logwood, *Extractum hæmatoxyli campechensis.*
Extract of logwood.

All these extracts are supposed to contain the virtues of the substances from which they are prepared, in a very pure and concentrated form. But this supposition is, we believe, in several instances erroneous. Extract of liquorice root consists chiefly of mucilage and saccharine matter, and is used as a demulcent in catarrh. It is sometimes purified by solution in water, straining, and a new evaporation. This is named refined liquorice. When made with care, it is exceedingly sweet, not at all bitterish or nauseous, more agreeable in taste than the root itself, of a pleasant smell, and reddish brown colour. This preparation would be very convenient for many purposes in the shops, if kept in a somewhat softer conconsistence than that of an extract.

EXTRACTS MADE WITH ALCOHOL AND WATER.

EXTRACTUM CINCHONÆ OFFICINALIS. *Extract of Cinchona.* Extract of the bark.

Take of
Bark of cinchona in powder, one pound,
Alcohol, four pounds.

Digest for four days, and pour off the tincture.

Boil the residuum in five pounds of distilled water for fifteen minutes, and filtrate the decoction boiling hot through linen. Repeat this decoction and filtration with

an equal quantity of distilled water, and reduce the liquor by evaporation to the consistence of thin honey. Draw off the alcohol from the tincture by distillation, until it also become thick; then mix the liquors thus inspissated, and evaporate in a bath of boiling water, saturated with muriate of soda, to a proper consistency.

This preparation is undoubtedly preferable to the watery extract of bark. By the joint action of the alcohol and water, every principle adhering to the mere ligneous fibre of the bark, is dissolved; and in the subsequent evaporation, the dissolved matter suffers less injury, partly from less heat being required to bring it to the due consistence, and partly, perhaps, from the alcohol resisting the oxygenation of the extract. It is, however, much more expensive; and the extract of bark to be found in the shops, is generally that prepared by the preceding formula. The dose of this extract is ten grains.

EXTRACTUM CONVOLVULI JALAPÆ. *Extract of Jalap.*

This is prepared in the same way.

This extract as a cathartick is capable of operating fully in a dose of ten or twelve grains.

CHAPTER XVI.

OF POWDERS.

THIS form is proper for such materials only, as are capable of being sufficiently dried for pulverizing, without the loss of their virtue. There are many substances, however, of this kind which cannot be conveniently taken in powder; bitter, acrid, and fetid drugs are too disagreeable: emollient and mucilaginous herbs and roots are too bulky; pure gums cohere, and become tenacious in the mouth; fixed alkaline salts deliquesce when exposed to the air; and volatile alkalis exhale. Many of the aromaticks, too, suffer great loss of their odorous principle when kept in powder, as in that form they expose a much larger surface to the air.

The dose of powders, in extemporaneous prescription, is generally about half a drachm; it rarely exceeds

a whole drachm, and is not often less than a scruple. Substances which produce powerful effects in smaller doses are not trusted to this form, unless their bulk be increased by additions of less efficacy; those which require to be given in larger ones are better fitted for other forms.

The usual vehicle for taking the lighter powders, is any agreeable thin liquid. The ponderous powders, particularly those prepared from metallick substances, require a more consistent vehicle, as syrups; for from thin ones, they soon subside.

Pulvis Cinnamomi Compositus. *Compound Powder of Cinnamon.* Aromatick Species.

Take of
Bark of cinnamon,
Lesser cardamom seeds,
Root of ginger, each equal parts.

Reduce them to a very fine powder, which is to be kept in a glass vessel well closed.

This formula is a very eligible one, and may be administered in all cases where powerful aromatick medicines are required. Its dose is from ten to twenty grains. Under the title of *aromatick powder* it has been employed in cold phlegmatick habits, and decayed constitutions, for warming the stomach, promoting digestion, and strengthening the tone of the viscera.

Pulvis Asari Compositus. *Compound Powder of Asarabacca.* Sternutatory.

Take of
Leaves of asarabacca, three parts,
..... sweet marjorum,
Flowers of lavender, each one part.

Rub them together to a powder.

This is an efficacious errhine, and superiour to herb snuff. It is often employed with great advantage in cases of obstinate headache, and of ophthalmias resisting other modes of cure. Five or six grains snuffed up the nostrils at bed time will operate the succeeding day as a powerful errhine, inducing frequent sneezing, and a copious discharge from the nose.

PULVIS CARBONATIS CALCIS COMPOSITUS. *Compound Powder of Carbonate of Lime.* Chalk Powder.

Take of

Prepared carbonate of lime, four ounces,
Nutmeg, half a drachm,
Bark of cinnamon, one drachm and a half.

Reduce them together to powder.

The addition of the aromaticks in the above formula, coincides with the general intention of the remedy, which is indicated for weakness and acidity in the stomach, and in diarrhœa proceeding from acidity. Dose from a scruple to a drachm.

PULVIS IPECACUANHÆ ET OPII. *Powder of Ipecacuan and Opium.* Dover's Powder.

Take of

Root of ipecacuan in powder,
Opium, of each one part,
Sulphate of potass, eight parts.

Triturate them together into fine powder.

The sulphate of potass, from the grittiness of its crystals, is perhaps better fitted for tearing and dividing the tenacious opium, than any other salt. The operator should be careful that the opium and ipecacuan be equally diffused through the whole mass of powder, otherwise different portions of the powder must be different in degree of strength.

In this composition we have an example of the power which one medicine has of modifying the action of another, the ipecacuan rendering the operation of the opium as a sudorifick, much more certain than it would otherwise be, and appearing also to diminish its narcotick effect. This powder is the most certain sudorifick we possess, and as such was recommended by Dr. Dover as an effectual remedy in rheumatism. Modern practice confirms its reputation, not only in rheumatism, but also in dropsy, and several other diseases, where it is often difficult by other means to produce a copious sweat. The medium dose is fifteen grains; the operation of which is to be assisted by the sweating regimen; and

frequently it is necessary to give additional smaller doses at intervals, to produce sweat.

Pulvis Jalapæ Compositus. *Compound Powder of Jalap.*

Take of
Root of jalap, one part,
Super-tartrite of potass, two parts.

Grind them together to a very fine powder.

By this addition of super-tartrite of potass to jalap, the operation of the latter is supposed to be rendered less irritating, and more refrigerant. It is an excellent cathartick, operating freely in a dose of a drachm and a half. It is important that the ingredients should be accurately ground together, as the operation is thereby rendered much milder.

Pulvis Opiatus. *Opiate Powder.*

Take of
Opium, one part,
Prepared carbonate of lime, nine parts.

Rub them together to a very fine powder.

In this powder, the opium is the only active ingredient; it is merely divided by the substance mixed with it. Ten grains contain one grain of opium.

Pulvis Scammonii Compositus. *Compound Powder of Scammony.*

Take of
Gum-resin of scammony,
Super-tartrite of potass, equal parts.

Rub them together to a very fine powder.

In this powder, the operation of the scammony is supposed to be rendered milder as a purgative, by the super-tartrite of potass. It is also preferred to the scammony alone, as a hydragogue cathartick. Its dose is from ten to twenty grains.

PULVIS SUPER-SULPHATIS ALUMINÆ ET POTASSÆ COMPOSITUS. *Compound Powder of Super-Sulphate of Alumina and Potass.* Styptick Powder.

Take of
Super-sulphate of alumina and potass, four parts,
Kino, one part.

Rub them together to a fine powder.

This powder is composed of two very powerful astringents, and is sometimes used internally in menorrhagia, in repeated doses of ten or fifteen grains, and externally as a styptick application to bleeding wounds.

PULVIS ALOES CUM CANELLA. *Powder of Aloes with Canella.* Hiera Picra.

Take of
Socotorine aloes, one pound,
White canella, three ounces.

Powder separately, and then mix them.

This composition has long been known in the shops under the title of *hiera picra.* It is still retained in the London pharmacopœia. It furnishes us with a useful aloetick purgative, the canella operating as a good corrigent for the aloes. It is generally made into a tincture, by infusing in spirits. Hiera picra is an efficacious remedy for worms, especially the ascarides. One ounce is dissolved in a pint of proof spirits, and a table spoonful diluted with water is given to a child three or four years old, till it purges copiously.

PULVIS ASTRAGALI TRAGACANTHÆ COMPOSITUS. *Compound Powder of Tragacanth.*

Take of
Gum tragacanth,
..... arabick,
Starch, of each one ounce and a half,
Double refined sugar, three ounces.

To be conjointly pulverized.

This preparation is one of the mildest emollient remedies in hectick cases, coughs, strangury, and similar disor-

ders, occasioned by a thin, vitiated state of the fluids; the dose being two or three drachms often repeated.

PULVIS STANNI AMALGAMATIS. *Powder of the Amalgam of Tin.*

Take of
Tin, five parts,
Purified quicksilver, two parts,
Prepared carbonate of lime, one part.

Melt the tin, add to it the quicksilver, and rub them together; then add the carbonate of lime, and while the mixture is liquid, rub till the metallick particles disappear; lastly, while the mixture cools, reduce it to an impalpable powder.

This preparation comes from Dr. Fisher, president of the Massachusetts medical society. It is found admirably adapted to the purpose of destroying worms in children. For the removal of the long round worm (teretes,) there is not perhaps a more sure and effectual medicine. Dr. Fisher directs for a child about fifteen or twenty grains of the powder twice in a day, and to be continued until from twelve to twenty-four doses are taken, unless sooner relieved. A few grains of calomel may occasionally be added to keep the bowels open. Should the symptoms be very severe, a large dose of calomel should be given, otherwise the patient may be lost before the amalgam has time to operate.

CHAPTER XVII.

CONSERVES AND ELECTUARIES.

IN these preparations, vegetable matter bruised is mixed with about three times its weight of sugar, and beat into a uniform pulpy mass. It was supposed that the sugar, by its antiseptick quality would prevent the decomposition of the vegetable matter. This, however, is not the case. This form of preparation therefore, is not applied to any active medicine. The shops were formerly encumbered with many conserves altogether insignificant; the few now retained, have, in general, either an agreeable flavour to recommend them, or are capable of answering

some useful purposes as medicines. The sugar should be pounded by itself, and passed through a sieve, before it be mixed with the vegetable mass, for without this it cannot be properly incorporated. The common dose is the bulk of a nutmeg, or as much as can be taken at once or twice on the point of a knife.

Electuaries are compositions of the consistence, nearly of honey, and are generally made by adding to any powder, a sufficient proportion of syrup or mucilage. It is a form adapted to the exhibition of such medicines as are not ungrateful in taste or flavour. The ingredients are so proportioned, that the dose shall not be less than a tea spoonful, and not more than twice or thrice that quantity at a time.

Conserve of the outer rind of oranges, and conserve of red rose buds, require no particular remarks, except that their taste and virtues are compounded of those of sugar and the substance combined with it. The former is a pleasant stomachick, and the latter, a mild astringent.

Electuarium Aromaticum. *Aromatick Electuary.* Cardiack Confection.

Take of

Compound powder of cinnamon, one part,
Syrup of orange peel, two parts.

Mix and beat them well together, so as to form an electuary.

This composition is sufficiently grateful, and moderately warm. It is given in the form of a bolus, in doses of from five grains to a scruple, or upwards, as a cordial, or as a vehicle for more active substances.

Electuarium Cassiæ Fistulæ. *Electuary of Cassia.*

Take of

Pulp of the fruit of the cassia tree, six ounces,
Pulp of tamarinds,
Manna, each an ounce and a half,
Syrup of damask roses, six ounces.

Having beat the manna in a mortar, dissolve it in a gentle heat in the syrup; then add the pulps and evaporate them with a regular continued heat to the consistence of an electuary.

This composition is a very convenient officinal, to serve as a basis to purgative electuaries and other similar purposes. It is likewise taken by itself to the quantity of two or three drachms occasionally, for gently loosening the belly in costive habits.

ELECTUARIUM CASSIÆ SENNÆ. *Electuary of Senna.* Lenitive Electuary.

Take of
Leaves of senna, eight ounces,
Coriander seeds, four ounces,
Root of liquorice, three ounces,
Figs,
Pulp of prunes, each one pound,
..... of tamarinds, half a pound,
Double refined sugar, two pounds and a half.

Powder the senna with the coriander seeds, and sift out ten ounces of the mixed powder. Boil the remainder with the figs and liquorice in four pounds of water, to one half; then press out and strain the liquor. Evaporate this strained liquor to the weight of about a pound and a half; then add the sugar, and make a syrup; add this syrup by degrees to the pulps, and, lastly, mix in the powder.

This electuary is a very convenient laxative, and has long been in common use among practitioners. Taken to the size of a nutmeg or more, as occasion may require, it is an excellent laxative for loosening the belly in costive habits.

ELECTUARIUM CATECHU. *Electuary of Catechu.* Japonick Confection.

Take of
Extract of catechu, four ounces,
Kino, three ounces,
Bark of cinnamon,
Nutmeg, each one ounce,
Opium diffused in a sufficient quantity of Spanish white wine, one drachm and a half,
Syrup of red roses boiled to the consistence of honey, two pounds and a quarter.

Reduce the solids to powder ; and having mixed them with the opium and syrup, make them into an electuary.

This electuary affords a combination of the more powerful astringents, rendered grateful by aromaticks, and having its efficacy, as a remedy in diarrhœa, increased by the opium. It is the basis of the common extemporaneous astringent mixture. One grain of opium is contained in rather more than three drachms.

ELECTUARIUM OPIATUM. *Opiate Electuary.* Thebaick Electuary.

Take of

Compound powder of cinnamon, six ounces,
Virginian snakeroot in fine powder, three ounces,
Opium diffused in a sufficient quantity of Spanish white wine, half an ounce,
Syrup of ginger, one pound.

Mix them and form an electuary.

This has kept its place in the pharmacopœias as a substitute for the mithridate and theriaca andromachi ; officinal preparations once highly celebrated, but now discarded. Each drachm prepared according to the above formula, contains a grain and a half of opium.

The action which this electuary will produce on the living system, is abundantly apparent from the nature of its ingredients.

CHAPTER XVIII.

TROCHES.

TROCHES or lozenges, consist of powders brought to a solid form by the addition of mucilage. When moist, they form a soft paste, in which state they are cut into square or round pieces; and these are hardened by drying. It is a form adapted principally to such medicines as are designed to dissolve slowly in the mouth, and hence they are always rendered pleasant by the addition of a large proportion of sugar. They are seldom active remedies.

Trochisci Carbonatis Calcis. *Troches of Carbonate of Lime.* Troches of Chalk.

Take of
Prepared carbonate of lime, four ounces,
Gum arabick, one ounce,
Nutmeg, one drachm,
Double refined sugar, six ounces.

Powder them together, and form them with water into a mass, which is to be made into troches.

This is a pleasant form under which carbonate of lime may be given as an antacid; and it is useful in diarrhœa.

Trochisci Glycyrrhizæ cum Opio. *Troches of Liquorice with Opium.*

Take of
Opium, two drachms,
Tincture of balsam of tolu, half an ounce,
Simple syrup, eight ounces,
Extract of liquorice, softened in warm water,
Gum arabick in powder, each five ounces.

Grind the opium well with the tincture, then add by degrees the syrup and extract; afterwards gradually sprinkle upon the mixture the powdered gum arabick. Lastly, dry them so as to form a mass to be made into troches, each weighing ten grains.

These troches are very effectual in relieving the tickling cough frequently attending catarrh. The opium is the active ingredient; the others cover its taste and flavour, and render the composition pleasant, adding at the same time a demulcent quality. One drachm or six troches contain one grain of opium, and from six to twelve may be taken in twenty-four hours.

Trochisci Magnesiæ. *Troches of Magnesia.*

Take of
Magnesia, four ounces,
Double refined sugar, two ounces,
Root of ginger powdered, one scruple.

Triturate them together, and with the addition of the mucilage of gum arabick, make troches.

Magnesia may be conveniently administered, under this form, as an antacid, and at the same time it tends to keep the bowels open.

CHAPTER XIX.

PILLS.

To this form, those drugs are particularly adapted, which in a small dose, and whose nauseous and offensive taste or smell, require them to be concealed from the palate. Pills dissolve the most difficultly in the stomach, and produce the most gradual and lasting effects, of all the internal forms. This is, in some cases, of great advantage; in others, it is a quality not at all desirable; and sometimes, may even be of dangerous consequence, particularly with regard to emeticks, which, if they pass the stomach undissolved, and afterwards exert themselves in the intestines, operate there as violent cathartick. Hence emeticks are scarce ever given in pills; and hence, to the resinous and difficultly soluble substances, saponaceous ones ought to be added, in order to promote their solution.

Gummy resins, and inspissated juices, are sometimes soft enough to be made into pills, without addition. Where any moisture is requisite, spirit of wine is more proper than syrups and conserves, as it unites more readily with them, and does not sensibly increase their bulk. Light, dry powders require syrups or mucilages, and the more ponderous, as the mercurial and other metallick preparations, thick honey, conserve, or extracts. Light powders require about half their weight of syrup; or of honey, about three fourths their weight, to reduce them into a due consistence for forming pills. Half a drachm of the mass will make five or six pills of a moderate size.

Gums and inspissated juices, are to be first softened with the liquid prescribed; the powders are then to be added, and the whole beat thoroughly together, until they be perfectly mixed. The masses for pills are best kept in bladders, which should be moistened with some of the same kind of liquid that the mass was made up with, or with some proper aromatick oil.

Pilulæ Aloeticæ. *Aloetick Pills.*

Take of
Gum-resin of socotorine aloes in powder,
Soap, equal parts.

Beat them with simple syrup into a mass fit for making pills.

Under this simple form aloes is very commonly exhibited as a cathartick. Two pills are a medium dose.

Pilulæ Aloes et Assæ Fœtidæ. *Pills of Aloes and Assa Fœtida.*

Take of
Gum-resin of socotorine aloes in powder,
Gum-resin of assa fœtida, each one ounce,
Soap, half an ounce,
Opium, one drachm.

Form them into a mass with mucilage of gum arabick.

These pills, in doses of about ten grains twice a day, produce the most salutary effects in cases of dyspepsia, attended with flatulence and costiveness.

Pilulæ Aloes et Colocynthidis. *Pills of Aloes and Coloquintida.* Pilulæ Cocciæ.

Take of
Gum-resin of socotorine aloes,
..... scammony, each eight parts,
Fruit of coloquintida, four parts,
Volatile oil of cloves,
Sulphate of potass with sulphur, each one part.

Reduce the aloes and scammony into a powder with the salt; then let the fruit of coloquintida, beat into a very fine powder, and the oil be added; lastly, make it into a proper mass with the mucilage of gum arabick.

In these pills we have a very useful and active purgative; and where the simple aloetick pill is not sufficient to obviate costiveness, this will often effectually answer the purpose. These pills often produce a copious discharge in cases of obstinate costiveness, when taken to the extent of only five or ten grains; but they may be employed in much larger doses. They are, however,

seldom used with a view of producing proper catharsis. Half a drachm of the mass, contains about five grains of the colocynth, ten of aloes, and ten of scammony.

PILULÆ ALOES ET MYRRHÆ. *Pills of Aloes and Myrrh.* Rufus's Pills.

Take of
Gum-resin of socotorine aloes, two ounces,
Myrrh, one ounce,
Saffron, half an ounce.

Beat them into a mass with a proper quantity of simple syrup.

These pills have long continued in practice, as a stimulating aperient. Given to be the quantity of half a drachm or two scruples, they prove considerably cathartick, but they answer much better purposes in smaller doses as laxatives or alteratives. Two or three for a dose.

PILULÆ ASSÆ FŒTIDÆ COMPOSITÆ. *Compound Pills of Assa Fœtida.* Gum Pills.

Take of
Gum-resin of assa fœtida,
Galbanum,
Myrrh, each eight parts,
Purified oil of amber, one part.

Beat them into a mass with simple syrup.

These pills are designed for anti-hystericks, and emmenagogues, and are very well calculated for answering those intentions. Half a scruple, a scruple, or more, may be taken every night or oftener.

PILULÆ ACETITIS PLUMBI ET IPECACUANHÆ. *Pills of Acetite of Lead and Ipecacuan.*

Take of
Acetite of lead,
Root of ipecacuan in powder, of each one drachm,
Opium, ten grains.

Beat them with simple syrup into a mass to be divided into forty equal pills.

In most cases of internal hæmorrhage, but more especially in uterine profluvia attended by debility, these pills, taken one every three or four hours, seldom fail to produce the desired astringent effect; and if their use be duly persisted in, will in general induce that salutary change in the system upon which a radical cure depends.

PILULÆ AMMONIARETI CUPRI. *Pills of Ammoniaret of Copper.* Copper Pills.

Take of
Ammoniaret of copper in fine powder, sixteen grains,
Bread crumb, four scruples,
Solution of carbonate of ammonia, as much as may be sufficient.

Beat them into a mass, to be divided into thirty-two equal pills.

It is under this form that ammoniaret of copper is given in epilepsy and the other spasmodick diseases in which it has been employed. Half a grain of it is contained in each pill. One pill is given at first, night and morning, and the dose is gradually increased.

PILULÆ HYDRARGYRI. *Pills of Quicksilver.* Mercurial Pills. Blue Pills.

Take of
Purified quicksilver,
Conserve of red roses, each one ounce,
Starch, two ounces.

Triturate the quicksilver with the conserve, in a glass mortar, till the globules completely disappear, adding occasionally a little mucilage of gum arabick; then add the starch, and beat the whole with water into a mass, which is immediately to be divided into four hundred and eighty equal pills.

The common mercurial pill is one of the best preparations of mercury, and may in general supersede most other forms of this medicine. In its preparation the mercury is minutely divided, and probably converted into the black oxide. To effect its mechanical division, it must be triturated with some viscid substance. Soap, resin of guaiack, honey, extract of liquorice, manna, and

conserve of roses, have all been at different times recommended, and either of them may be employed.

We learn when the mercury is completely extinguished, most easily, by rubbing a very little of the mass with the point of the finger on a piece of paper, if no globules appear. As soon as this is the case, it is necessary to mix with the mass a proportion of powder of liquorice or starch, to give it a proper degree of consistency. It is necessary to form the mass into pills immediately, as it soon becomes hard. While this preparation of mercury is much milder in its operation than some others, it is perhaps capable of answering every purpose which the remedy can serve. The common dose, given with the view of inducing the common mercurial action, is two pills at bed time, and one in the morning, which in particular cases and habits, require to be increased. Four, or six pills given at once, generally excite purging. Each pill contains one grain of quicksilver.

PILULÆ OPIATÆ. *Pills of Opium.* Thebaick Pills.

Take of

Opium, one part,
Extract of liquorice, seven parts,
Jamaica pepper, two parts.

Soften the opium and extract separately, with diluted alcohol, and having beaten them into a pulp, mix them; then add the pepper reduced to powder; and lastly, having beat them well together, form the whole into a mass.

This affords a form under which the exhibition of opium may be concealed from the patient. Two pills or ten grains of the mass contain one grain of opium. In the formula of the London college, the aromatick is omitted, and the proportion of opium increased; so that each pill contains one grain.

Some complain that the extract of liquorice occasions the mass to become too hard and difficult to manage. The following formula, therefore, may be substituted, or a stronger preparation: viz.

Take of

Castile soap, eight parts,
Camphor, six parts,
Opium, four parts.

The several articles being separately powdered, mix and beat them into a mass.

Pilulæ Rhei Compositæ. *Compound Pills of Rhubarb.* Stomachick Pills.

Take of
Root of rhubarb in powder, one ounce,
Gum-resin of socotorine aloes, six drachms,
Myrrh, half an ounce,
Volatile oil of peppermint, half a drachm.

Make them into a mass with a sufficient quantity of syrup of orange peel.

This is a moderate laxative much employed, especially in dyspeptick affections, to obviate costiveness, and gently stimulate the stomach and intestines. Two pills are taken at bed time.

Pilulæ Scilliticæ. *Squill Pills.*

Take of
Dried root of squills in fine powder, one scruple,
Ammoniacum,
Lesser cardamom seeds in powder,
Extract of liquorice, each one drachm.

Mix and form them into a mass with simple syrup.

This is an elegant and commodious form for the exhibition of squills, whether for promoting expectoration, or with the other intentions to which that medicine is applied. As the virtues of the compound is derived chiefly from the squills, the other ingredients are often varied in extemporaneous prescriptions. If, however, the above form should be found to be too hard and difficult to manage, the following formula may be preferred: viz.

Take of
Dried root of squills in fine powder,
Gum ammoniacum, each one drachm,
Castile soap, one ounce.

Mix them into a mass with a sufficient quantity of balsam copaiva.

Pilulæ Plummeri. *Plummer's Pills.*

Take of

Precipitated sulphur of antimony,
Mild muriate of mercury, each three drachms,
Extract of gentian,
Hard Spanish soap, each one drachm.

Let the mercury be triturated with the sulphur; then add the extract, and form a mass with jelly of soap.

These pills were recommended to the attention of the publick, about forty years since, by Dr. Plummer, whose name they long bore. He represented them in a paper, which he published in the Edinburgh medical essays, as a very useful alterative; and on his authority they were at one time much employed. In some cutaneous and even venereal affections, they are yet in repute, as being an efficacious remedy in doses of from four to eight or ten grains, morning and night.

Pilulæ Gambogiæ Compositæ. *Compound Gamboge Pills.* (Lond. Pharm.)

Take of

Gamboge in powder,
Socotorine aloes in powder,
Compound powder of cinnamon, of each one drachm,
Soap, two drachms.

Mix the powders together; then, adding the soap, beat the whole into one mass.

By the addition of the gamboge to the aloes, its cathartick power is increased, and a composition afforded, more active than the aloetick pill. Two or three pills are a proper dose.

Pilulæ Ferri cum Myrrha. *Pills of Iron with Myrrh.* (Lond. Pharm.)

Take of

Myrrh, beat to powder, two drachms,
Sub-carbonate of soda,
Sulphate of iron,
Sugar, of each a drachm.

Triturate the myrrh with the sub-carbonate of soda; then, having added the sulphate of iron, triturate them

again; lastly, beat the whole together, until they form a uniform mass.

This is the same composition, with regard to the active ingredients, as forms the basis of the compound mixture of iron, the substitute for Griffith's mixture; and it may be occasionally convenient to prescribe it under the form of pill, or to form the mixture from it extemporaneously by diffusion in water.

PILULÆ AURI MURIATIS. *Gold Pills.* (Pharm. of New York Hospital.)

℞ Muriate of gold,	-	gr. x.
Liquorice root powdered,		ʒ iii.
Thick mucilage of gum arabick,		q. s.

To make a mass which is to be divided into one hundred and fifty pills.

These pills are given at first one, afterwards two in a day, as an efficacious remedy in confirmed lues venerea. [See Aurum.]

CHAPTER XX.

CATAPLASMS.

BY cataplasms are in general understood, those external applications, which are brought to a due consistence or form for being properly applied, not by means of oily and fatty matters, but by water or watery fluids. Of these, not a few are had recourse to in actual practice; but they are seldom prepared in the shop of the apothecary, and, in some of the best modern pharmacopœias, no formula of this kind are introduced. The London and Dublin colleges, however, although they have abridged the number of cataplasms, still retain a few; and it is not without some advantage that there are fixed forms for the preparation of them.

CATAPLASMA LINI. *Linseed Poultice.*

Take of
Linseed in powder, half a pound,
Hot water, one pound and a half.

The powder is to be gradually sprinkled into the hot water, while they are quickly blended together with a spoon.

Poultices are commonly made too thin, by which means the least pressure, or their own gravity, remove them from the part; they should be thick enough to support a certain form when applied. This is the best and the most convenient of all the emollient poultices for common cases, and may in a great measure supersede the bread and milk one so much in use formerly, and which is so liable to become brittle when dried. The mucilage of the slippery elm bark will also be found an excellent application of this kind for most of the purposes required.

Cataplasma Dauci. *Carrot Poultice.*

Bruise the fresh carrots in a mortar into a pulp, or the carrots may be first boiled.

The carrot poultice is employed as an application to ulcerated cancers, scrofulous sores of an irritable kind, and to various malignant inveterate ulcers.

Cataplasma Fermenti. *Fermenting Poultice.*

Take of

Flour, a pound,
Yeast of beer, half a pint.

Mix them, and apply a gentle heat until the mixture begins to rise.

The yeast mixed with the flour, and aided by the heat applied, soon excites fermentation, and the cataplasm in this state has been applied with much advantage as an anodyne in painful and irritable sores, and as an antiseptick in ulceration with fœtor. Its efficacy appears to depend on the carbonick acid gas evolved by the fermentative process.

Cataplasma Aluminis. *Cataplasm of Alum.* Alum Curd.

Take the whites of two eggs; agitate them with a piece of alum, until a coagulum be formed.

This preparation taken from Riverius, is a useful astringent epithem for sore moist eyes. Where the complaint is violent, this preparation, after the inflam-

mation has subsided a little to bleeding, is one of the best external remedies. It is to be spread upon lint, and applied at bed time.

Cataplasma Sinapeos. *Mustard Cataplasm.*

Take of

Mustard, in powder,
Crumb of bread, of each, half a pound,
Vinegar, as much as is sufficient.

Mix and make a cataplasm.

Cataplasms of this kind, are commonly known by the name of sinapisms. They were formerly frequently prepared in a more complicated state, containing garlick, black soap, and other similar articles. But the above simple form will answer every purpose which they are capable of accomplishing. They are employed only as stimulants; they often inflame the part, and raise blisters; but not so perfectly as cantharides. Their chief advantage depends upon the suddenness of their action.

This preparation is the common sinapism which is applied with advantage, as a powerful stimulant, to the soles of the feet in typhus, where there is a determination to the head, and in comatose affections.

CHAPTER XXI.

LINIMENTS, OINTMENTS, CERATES, AND PLASTERS.

These are all combinations of fixed oil, or animal fat, with other substances, and differ from each other only in consistence. A liniment is of the consistence of thin honey; an ointment is firmer; and a cerate still harder. Oil or lard is their common basis; the due consistence is given by wax or spermaceti, and to the composition may be added any substance which is to be used under this form. *Plasters* are the most solid, and when cold, should be firm, and should not adhere to the fingers, but when gently heated, should become sufficiently soft to spread easily, and should then adhere to the skin. Plasters derive their firmness, either from a large proportion of wax, or from the presence of some metallick oxide, such as

that of lead. The following general directions are given in the Edinburgh pharmacopœia for their preparation.

In making these compositions, the fatty and resinous substances are to be melted with a gentle heat, and then constantly stirred, adding at the same time the dry ingredients, if there be any, until the mixture on cooling become stiff.

Linimentum Simplex. *Simple Liniment.*

Take of
Olive oil, four parts,
White wax, one part.

Unguentum Simplex. *Simple Ointment.*

Take of
Olive oil, five parts,
White wax, two parts.

Unguentum Physeteris Macro Cephali Sevi. *Ointment of Spermaceti.*

Take of
Spermaceti, two parts,
Olive oil,
White wax, each one part.

Melt them together over a slow fire, stirring them constantly and briskly until they be cold.

These several compositions differ merely in consistence. They are useful cooling ointments for excoriations and other frettings, and for softening the skin and healing chaps. They are also applied spread on linen as usual dressings to slight wounds and simple ulcers. Frequently they are employed as the basis of more compounded ointments.

Linimentum Hydrargyri Compositum. *Compound Liniment of Quicksilver.* (Lond. Pharm.)

Take of
The strong mercurial ointment,
Prepared lard, of each four ounces,
Camphor, one ounce,
Rectified spirit of wine (alcohol) two fluidrachms,
Water of ammonia, four fluid ounces.

Rub the camphor first with the spirit, then with the lard and mercurial ointment, lastly adding gradually the water of ammonia, mix the whole together.

This is designed as a stimulating application and discutient, to be applied to indolent tumours or collections of fluid, a truly excellent formula for all cases in which the object is to quicken the action of the absorbents, and gently stimulate the surface of parts. It is a capital application for diminishing the indurated state of particular muscles, a peculiar affection every now and then met with in practice ; and it is particularly well calculated for lessening the stiffness and chronick thickening often noticed in the joints.

Unguentum Oxidi Plumbi Albi. *Ointment of White Oxide of Lead.* White Ointment.

Take of
Simple ointment, five parts,
White oxide of lead, one part.

Or, the oxide may be added in the same proportion to the spermaceti ointment, its firmer consistence being better adapted to the purpose of keeping the oxide uniformly suspended.

This is a cooling desiccative ointment of great use when applied to excoriated surfaces ; and has been a common application to burns and superficial inflammation.

Unguentum Acetitis Plumbi. *Ointment of Acetite of Lead.* Saturnine Ointment.

Take of
Simple ointment, twenty parts,
Acetite of lead, one part.

This is an excellent cooling ointment, and of the greatest use in many cases. It is applied to the same purposes as the preceding, and is more frequently employed.

Ceratum Lythargyri Acetati Compositum. *Compound Cerate of Acetated Litharge.* Goulard's Cerate.

Take of
Water of acetated litharge, two ounces and a half,
Yellow wax, four ounces,
Olive oil, nine ounces,
Camphor, half a drachm.

Rub the camphor with a little of the oil. Melt the wax with the remaining oil, and as soon as the mixture begins to thicken, pour in by degrees the water of acetated litharge, and stir constantly until it be cold; then mix in the camphor previously rubbed with oil.

This ointment, usually named *Goulard's cerate*, has been rendered famous by the recommendations of Mr. Goulard, a French surgeon. It is unquestionably in many cases very useful; it cannot, however, be considered as varying essentially from the saturnine ointments already mentioned. It is employed with nearly the same intentions, and differs from them chiefly in consistence.

Unguentum Rosarum. *Ointment of Roses.*

Take of

Hog's lard,
Fresh damask roses with their calices, each equal parts.

Let the roses be slightly bruised in a marble mortar with a pestle of wood, and put them in a vessel with the lard; place this over a gentle fire, so as to evaporate a great part of the moisture; then press it through linen and suffer it to cool. Separate the feces which are on the top, and melt it in order to depurate.

Unguentum Aquæ Rosæ. *Ointment of Rose Water.*

Take of

Oil of sweet almonds, two ounces,
Spermaceti, half an ounce,
White wax, one drachm.

Melt the whole in a water bath, stirring it frequently; when melted, add of

Damask rose water, two ounces,

and stir the mixture continually till it is cold.

These more elegant compositions being similar in their properties to the preceding, are used for the same purposes.

UNGUENTUM STRAMONII. *Ointment of Thorn Apple.*

Take of
Leaves of thorn apple recently gathered and sliced, five pounds,
Hog's lard, fourteen pounds.

Let them simmer together over a gentle fire till the leaves become crisp and dry. Then press out the lard, return it into the vessel when cleansed, and add to every pound of the compound, of

Yellow wax, two ounces.

Set the whole on the fire; when the wax has melted remove the vessel, and let it rest while the contents gradually cool, that the impurities may subside. These must then be separated from the ointment.

This ointment has been found to afford relief in external inflammations, and hæmorrhoids. It is also highly beneficial in burns, and to allay the swelling of a cow's udder.

UNGUENTUM RESINOSUM. *Resinous Ointment.* Basilicon Ointment.

Take of
Hog's lard, eight parts,
Resin of pine, five parts,
Yellow wax, two parts:—Or

Take of
Yellow resin,
..... wax,
Hog's lard,
Oil of olives, equal weights.

This ointment, long known under the name of yellow basilicon, is commonly employed in dressing, for digesting, cleansing, and incarning wounds and ulcers.

UNGUENTUM PICIS. *Tar Ointment.*

Take of
Tar, five parts,
Yellow wax, two parts.

Equal parts of tar and mutton suet, are preferred by some as forming an ointment of a more firm consistence. The two compositions, however, cannot be considered as differing essentially from each other. As far as they have any peculiar activity, this entirely depends on the tar. From the empyreumatick oil and saline matters which it contains, it is undoubtedly of some activity. Accordingly it has been successfully employed against foul ulcers, and some cutaneous affections, particularly tinea capitis.

Unguentum Infusi Meloes Vesicatorii. *Ointment of Infusion of Cantharides.* Mild Epispastick Ointment.

Take of
Cantharides,
Resin of pine,
Yellow wax, each one part,
Hog's lard,
Venice turpentine, each two parts,
Boiling water, four parts.

Infuse the cantharides in the water for a night; then strongly press out and strain the liquor, and boil it with the lard till the water be consumed; then add the resin and wax, and when these are melted, take the ointment off the fire and add the turpentine.

This ointment, containing the soluble parts of the cantharides, uniformly blended with other ingredients, are more commodious, and in general occasion less pain, though little less effectual in their action, than the compositions with the fly in substance.

Unguentum Pulveris Meloes Vesicatorii. *Ointment of the Powder of Cantharides.* Strong Epispastick Ointment.

Take of
Resinous ointment, seven parts,
Powdered cantharides, one part.

This ointment is employed in the dressings for blisters, intended to be made perpetual, as they are called, or to be kept running for a considerable time; which in many chronick and acute diseases, is of great service. Particular care should be taken, that the cantharides employed in these compositions, be reduced into a very subtle pow-

der, and that the mixtures be made as equal and uniform as possible.

Unguentum Sulphuris. *Sulphur Ointment.* Antisporick Ointment.

Take of
Hog's lard, two parts,
Sublimed sulphur, one part.

To each pound of this ointment, add of

Volatile oil of lemons, or
..... of lavender, half a drachm.

Sulphur is a certain remedy for the itch, more safe than mercury. A pound of this ointment serves for four unctions. The patient is to be rubbed every night, a fourth part of the body each time. Though the disease may be thus cured by a single application, it is in general adviseable to touch the parts most affected for a few nights longer, and to conjoin the internal use of sulphur.

Unguentum Acidi Nitrosi. *Ointment of Nitrous Acid.*

Take of
Hog's lard, one pound,
Nitrous acid, six drachms.

Mix the acid gradually with the melted lard, and diligently beat the mixture as it cools.

The axunge in this ointment seems to be oxidized; for, during the action of the acid upon it, there is a great deal of nitrick oxide gas disengaged. It acquires a yellowish colour, and a firmer consistency; and forms an excellent and cheap substitute, in slight herpetick and other cutaneous affections, for the ointment of nitrate of mercury.

Unguentum Hydrargyri. *Ointment of Quicksilver.* Strong Mercurial Ointment.

Take of
Quicksilver,
Hog's lard, each three parts,
Mutton suet, one part.

Rub the quicksilver carefully in a mortar with a little of the hog's lard, until the globules entirely disappear;

then add the remainder of the lard and the suet, rubbing them well together.

Unguentum Hydrargyri Mitius. *Mild Ointment of Quicksilver.* Blue Ointment.

This is to be prepared as the preceding ointment, excepting that only one part of quicksilver is to be employed.

During the trituration of mercury with unctuous matter, it cannot be doubted that an oxidation of the metal is effected; and the efficacy of the ointment depends, in a great measure, on this oxide of mercury. It has been also supposed, with a sufficient probability, that the portion of sebacick acid formed in animal fat, when exposed to the air, may promote this oxidation, and combine with the oxide; and the improvement of the ointment on keeping, a fact long observed, is probably owing to the gradual formation of this sebate of mercury.

Mercurial ointment, is the form by which mercury is introduced into the system by external friction. It is a mode employed with advantage, in cases where the preparations administered internally, are liable to be too much determined to the intestines, so as to occasion griping and purging, and when it is necessary to introduce a large quantity of mercury speedily into the system; likewise in some local affections, particularly bubo. One drachm of the strong ointment, (that containing equal parts of the mercury and lard,) is introduced by friction in the evening, and frequently in the morning, until the system be affected. The inside of the thighs and legs are the parts most suitable for the application of the frictions. But it is frequently necessary to change the place, as even the mildest ointment is sometimes apt to excite topical inflammation, and render further application very inconvenient. During the process of inunction, the patient should be confined within doors in a well aired apartment, which should be kept in an equal and moderate temperature, and he should wear flannel next his skin. At each operation, it will require from twenty to thirty minutes of gentle friction by the patient himself, before a moderate fire. It is requisite that the ointment should be prepared with very great care; for, upon the degree of triture which has been employed, the activity of the mercury very much depends.

Several expedients have been contrived to facilitate the extinction of the mercurial globules by trituration; the most of these, however, are inadmissible. If sulphur be used, it will probably render the mercury inactive, and turpentine renders the ointment so acrid, that when applied by friction it produces irritation on the skin, or inflammation. Rancid fat, it has been found, extinguishes the quicksilver better than recent fat, and by the action of the metal the rancidity of the fat appears to be corrected. If the trituration be made at first with a little tallow, as being a harder substance than fat, the operation may be completed without much difficulty.

Half a drachm of camphor, added to one ounce of strong mercurial ointment, is much recommended to be rubbed on thickened, indurated parts, with a view of exciting the action of the absorbents. Rubbed along the course of the urethra, it is very serviceable in diminishing and removing chordee.

Unguentum Oxidi Hydrargyri Cinerei. *Ointment of Gray Oxide of Quicksilver.*

Take of
Gray oxide of quicksilver, one part,
Hog's lard, three parts.

This is designed as a substitute for the mercurial ointment, and as the quicksilver is fully oxidized, it has been supposed that it will prove more active. If this were sufficiently established, the facility and certainty of its preparation would be attended with great advantages.

Unguentum Sub-Muriatis Hydrargyri et Ammoniæ. *Ointment of Submuriate of Quicksilver and Ammonia.*

Take of
Submuriate of quicksilver and ammonia, one drachm,
Ointment of roses, one ounce and a half.

Let them be mixed very intimately.

This is a very elegant mercurial ointment, and is frequently made use of in the cure of obstinate cutaneous affections.

Unguentum Oxidi Hydrargyri Rubri. *Ointment of Red Oxide of Quicksilver.*

Take of
Red oxide of quicksilver by nitrous acid, one part,
Hog's lard, eight parts.

This is an excellent stimulating ointment, often of very great service in indolent, ill conditioned sores, when we wish to excite them to greater action. If it prove too stimulating, it may be weakened with axunge; and in this state, it is often applied to the eye-lids in chronick ophthalmia.

Unguentum Nitratis Hydrargyri. *Ointment of Nitrate of Quicksilver.* Yellow Ointment.

Take of
Purified quicksilver, one part,
Nitrous acid, two parts,
Hog's lard, three parts,
Olive oil, nine parts.

Dissolve the quicksilver in the nitrous acid, by digestion in a sand heat, and, while the solution is hot, mix with it the lard and oil, previously melted together, and just beginning to grow stiff. Stir them briskly together in a glass or wedgewood mortar, so as to form the whole into an ointment.

In this ointment, the nitrate of the quicksilver combines with the lard; and as there is also an excess of nitrick acid, it acts chemically on the fat, and gives to the composition a very firm consistence. It is a very active ointment, and as such, it is frequently employed with success in cutaneous and other topical affections, a small quantity being rubbed on the part.

Unguentum Nitratis Hydrargyri Mitius. *Milder Ointment of Nitrate of Quicksilver.*

This is prepared in the same manner as the preceding, with a triple quantity of hog's lard, and olive oil. It is, of course, a much milder application, and is designed to be also of a softer consistence; but, to obtain the latter

convenience, it is better to reduce the strong ointment, with the requisite proportion of lard.

Unguentum Sub-Acetitis Cupri. *Ointment of Sub-Acetite of Copper.* Ointment of Verdigris.

Take of
Resinous ointment, fifteen parts,
Sub-acetite of copper, one part.

This ointment is used for cleansing sores, and keeping down fungous flesh. Where ulcers continue to run from a weakness of the vessels of the parts, the tonick powers of the copper promise considerable advantage. It is also frequently used with advantage in cases of ophthalmia, depending on scrofula, where the palpebræ are principally affected; but, when it is to be thus applied, it is in general requisite that it should be somewhat weakened, by the addition of a proportion of simple ointment of hog's lard.

Unguentum Oxidi Zinci Impuri. *Ointment of Impure Oxide of Zinc.* Ointment of Tutty.

Take of
Simple liniment, five parts,
Prepared impure oxide of zinc, one part.

This and the following ointment are chiefly used in affections of the eye, particularly in those cases where redness arises rather from relaxation than from active inflammation.

Unguentum Oxidi Zinci. *Ointment of Oxide of Zinc.*

Take of
Simple liniment, six parts,
Oxide of zinc, one part.

Ceratum Simplex. *Simple Cerate.*

Take of
Olive oil, six parts,
White wax, three parts,
Spermaceti, one part.

This differs from the simple ointment, in containing a greater proportion of wax to the oil, and in the addition

of the spermaceti. But by these means, it obtains only a more firm consistence, without any essential change of properties.

CERATUM CARBONATIS ZINCI IMPURI. *Cerate of Impure Carbonate of Zinc.* Turner's Cerate.

Take of
Simple cerate, five parts,
Prepared impure carbonate of zinc, one part:

—Or,

Take of
Olive oil, two pounds,
Yellow wax,
Prepared impure carbonate of zinc, each one pound.

This composition is formed upon that which was formerly called *Turner's cerate.* The inventor strongly recommends it in cutaneous ulcerations and excoriations. It appears, from experience, to be an excellent epulotick, and as such, is frequently made use of in practice.

CERATUM SABINÆ. *Savine Cerate.*

Take of
Fresh leaves of cedar savine bruised, two pounds,
Yellow wax, one pound,
Hog's lard, four pounds.

Boil the leaves of the savine with the lard and wax melted together till they become crisp, and while hot strain the mixture through a coarse cloth. It is sometimes prepared from the leaves, reduced to fine powder, and mixed with lard.

The ceratum sabinæ (see juniperus virginiana) is designed as an irritating application with the view of exciting a perpetual discharge from blisters as a remedy in chronick diseases of the joints, &c. and in other cases where such discharge is required. It is an admirable preparation of that shrub, and has been found by experience to answer every purpose for which it was originally suggested by Dr. Crowther. On the use of this cerate, immediately after the cuticle raised by the blister is removed, it should be remarked, that experience has proved

the advantage of using the application lowered by half or two thirds of the unguentum ceræ : an attention to this direction will produce less irritation and more discharge, than if the savine cerate is used in its full strength. But as the discharge diminishes, the strength of the savine dressing should be proportionally increased.

EMPLASTRUM SIMPLEX. *Simple Plaster.*

Take of
Yellow wax, three parts,
Mutton suet,
Resin of pine, each two parts.

The principal use of this plaster is as a dressing, when spread thin on linen, to the part to which a blister has been applied.

EMPLASTRUM RESINOSUM COMPOSITUM. *Compound Resinous Plaster.*

Take of
Burgundy pitch, two pounds,
Galbanum, one pound,
Resin of pine,
Yellow wax, each four ounces,
Fixed oil of mace, one ounce.

To the pitch, resin and wax melted together, add first the galbanum and then the oil of mace.

This plaster has been applied to the region of the stomach, as a stimulus, to relieve nausea and vomiting, and is considered as the most elegant formula of the kind.

EMPLASTRUM MELOES VESICATORII. *Plaster of Spanish Flies.* Blistering Plaster.

Take of
Mutton suet,
Yellow wax,
Resin of pine,
Cantharides, each equal weights.

Beat the cantharides into a fine powder, and add them to the other ingredients previously melted and removed from the fire.

This is the plaster usually employed to raise a blister. It is of a softer consistence than the other plasters, that it

may admit of being spread without the assistance of heat, which would impair the acrid quality of the cantharides. It requires to be applied twelve hours to produce a perfect blister; it is then removed; the vesicle is cut, and the inflamed surface dressed with simple cerate or plaster.

EMPLASTRUM MELOES VESICATORII COMPOSITUM. *Compound Plaster of Spanish Flies.*

Take of
Venice turpentine, eighteen parts,
Burgundy pitch,
Cantharides, each twelve parts,
Yellow wax, four parts,
Sub-acetite of copper, two parts,
Mustard seed,
Black pepper, each one part.

Having first melted the pitch and wax, add the turpentine, and to these in fusion, and still hot, add the other ingredients, reduced to a fine powder and mixed, and stir the whole carefully together, so as to form a plaster.

It occasionally happens, that the common plaster of cantharides is insufficient to excite a blister, even when its surface has been sprinkled over with powdered cantharides. In such cases, or even in others, where it is necessary that a blister should be quickly raised, this more powerful composition may be employed. It certainly contains a sufficient variety of stimulating ingredients, and its operation is accompanied with a pungent sensation of heat.

EMPLASTRUM OXIDI PLUMBI SEMIVITREI. *Plaster of the Semi-Vitrified Oxide of Lead.* Common Plaster.

Take of
Semi-vitrified oxide of lead, one part,
Olive oil, two parts.

Boil them, adding water, and constantly stirring the mixture till the oil and oxide be formed into a plaster.

Oxides of lead, boiled with oils, unite with them into a plaster of an excellent consistence, and which makes a proper basis for several other plasters.

In the boiling of these compositions, a quantity of water must be added to prevent the plaster from burning

and growing black. Such water as it may be necessary to add during the boiling, must be previously made hot; for cold liquor would not only prolong the process, but likewise occasion the matter to explode, and be thrown about with violence, to the great danger of the operator.

This accident will equally happen upon the addition of hot water, if the plaster be extremely hot. It is therefore better to remove it from the fire a little, before each addition of water. This plaster, which has long been known under the name of *diachylon*, is a common application in excoriations of the skin, slight fresh wounds, and the like. They keep the part soft, and somewhat warm, and defend it from the air, which is all that can be expected in these cases, from any plasters.

Emplastrum Resinosum. *Resinous Plaster.* Adhesive Plaster.

Take of
Plaster of semi-vitrified oxide of lead,
Resin of pine, equal weights.

This plaster rendered more adhesive, and somewhat stimulating, by this intermixture of resin, is used for keeping on other dressings, for retaining the edges of recent wounds together, when we are endeavouring to secure them by the first intention, and for giving mechanical support to new flesh, and contracting the size of ulcers in the manner recommended by Mr. Baynton, for the cure of ulcers of the legs.

Emplastrum Assæ Fœtidæ. *Plaster of Assa Fœtida.* Anti-Hysterick Plaster.

Take of
Plaster of semi-vitrified oxide of lead,
Gum-resin of assa fœtida, each two parts,
Galbanum,
Yellow wax, each one part.

As an application to the umbilical region, or over the whole abdomen, in hysterick cases, this plaster has sometimes produced good effects. But probably more from its giving an additional degree of heat to the part, than from any influence, derived from the fetid gums.

EMPLASTRUM GUMMOSUM. *Gum Plaster.*

Take of
Plaster of semi-vitrified oxide of lead, eight parts,
Ammoniacum,
Galbanum,
Yellow wax, each one part:—Or,

The following form is preferred by some for the same purposes.

Take of
Plaster of semi-vitrified oxide of lead, three pounds,
Strained galbanum, half a pound,
Common turpentine,
Frankincense, each three ounces.

Melt the three first articles together, and add the last in powder; stir them well together.

This plaster is used as a digestive and suppurative; particularly in abscesses, after a part of the matter has been maturated and discharged, for suppurating or discussing the remaining hurt part; but it is very doubtful whether it derives any advantage from the gums entering its composition.

EMPLASTRUM SAPONACEUM. *Saponaceous Plaster.*

Take of
Plaster of semi vitrified oxide of lead, four parts,
Gum plaster, two parts,
Soap sliced, one part.

To the plasters melted together, add the soap; then boil for a little while so as to form a plaster.

This is likewise supposed to possess a discutient quality, but is much inferiour to the mercurial plaster, and is scarcely ever used.

EMPLASTRUM HYDRARGYRI. *Plaster of Quicksilver.* Blue Plaster.

Take of
Olive oil,
Resin of pine, each one part,
Quicksilver, three parts,
Plaster of semi-vitrified oxide of lead, six parts.

Melt the oil and resin together, and when this mixture is cold let the quicksilver be rubbed with it till the globules disappear; then add by degrees the plaster of semi-vitrified oxide of lead melted, and let the whole be accurately mixed.

This mercurial plaster is considered as a powerful resolvent and discutient, acting with much greater certainty for these intentions than any composition of vegetables alone. Pains in the joints and limbs from a venereal cause, nodes, tophi, and beginning indurations, are said sometimes to yield to its application.

EMPLASTRUM OXIDI FERRI RUBRI. *Plaster of Red Oxide of Iron.* Strengthening Plaster.

Take of

Plaster of semi-vitrified oxide of lead, twenty-four parts,
Resin of pine, six parts,
Yellow wax,
Olive oil, each three parts,
Red oxide of iron, eight parts.

Grind the red oxide of iron with the oil, and then add it to the other ingredients, previously melted.

This plaster spread on leather is used as the common strengthening plaster in weaknesses of the large muscles, as of the loins; and its effects seem to proceed from the artificial mechanical support given to the part, which may also be done by any other plaster that adheres with equal firmness.

APPENDIX.

No. I.

OF MINERAL WATERS.

The chemical analysis of mineral waters is of considerable importance, as determining the principles in which their active powers reside, and thus enabling the physician to employ them with more advantage and discrimination. Mineral waters include all such fluids as are naturally impregnated with heterogeneous matter, which they have dissolved within the bowels of the earth, whether sulphureous, metallick, or saline; and as many of these are successfully employed in medicine, they have received the appellation of medicinal waters. They derive their peculiarity of character in general either from containing carbonick acid, or soda not neutralized, sulphuretted hydrogen, purging salts, earthy salts, or iron; or from their temperature exceeding in a greater or less degree that of the atmosphere. These waters have also a specification depending on the foreign substances which they contain. Waters impregnated with free carbonick acid gas sparkle when drawn from the spring, or poured into a glass; they have a taste more or less pungent and acidulous, but soon become vapid from exposure to the air. Along with the carbonick acid, there generally are present portions of saline, earthy or metallick matter, chiefly carbonates of lime, magnesia and iron. The quantity of carbonick acid contained in the mineral waters is very various. When highly impregnated with *carbonick acid gas*, they are grateful from their pungency, sit light on the stomach, and in a large dose produce even sensibly a degree of exhilaration; they increase the appetite, and generally have a diuretick effect. They prove useful in dyspeptick affections, from the grateful and moderate stimulus exerted by the carbonick acid on the stomach, aided by the diluent operation of the water; and hence the advantage derived from them in the numerous chronick affections connected with impaired power of the digestive organs. They generally

also contain some saline substances which communicate additional powers, and the operation of these is usually promoted, or at least they are rendered more grateful by the carbonick acid. Those which contain carbonate of soda, as Seltzer water, prove more powerfully diuretick, and are employed with advantage as palliatives in urinary calculus, and in the painful discharge of urine from other affections of the urinary organs. Those waters impregnated with iron are more particularly employed in those diseases in which that metal is employed.

The *sulphureous mineral waters* owe their distinguishing character to an impregnation of sulphuretted hydrogen; and they are at once recognised by their peculiar fœtid smell. They almost uniformly contain saline substances which modify their powers. From the action of the sulphuretted hydrogen, they are employed more particularly in cutaneous affections; and from the combined action of this and the saline matter which generally has a purgative effect, they are farther used in diseases of the digestive organs, dyspepsia, hypochondriasis, torpor of the intestines, and visceral obstructions; and also in scrofulous affections. They are also applied locally in cutaneous eruptions, and the warm sulphurous baths have been in particular celebrated for their efficacy under this form of application.

The *saline mineral waters* comprise those in which, without any large proportion of aerial matter, various saline compounds, generally neutral, exist. The salts most usually present are sulphates, muriates, and carbonates; and the bases with which the acids forming these are combined, are soda, magnesia, and lime. These waters are usually aperient, the substances which they hold dissolved being either so far as can be determined inert, such as the sulphate and carbonate of lime; or being cathartick, as the greater number of the other compound salts. It has always been remarked too with regard to them, that their cathartick power is greater than could be supposed from the extent of their saline impregnation as determined by analysis; a proof of the influence of dilution in the operation of mineral waters. They are usually employed in diseases, where it is of advantage to stimulate the digestive system, the intestinal canal, and the secreting organs connected with it, or where advantage is derived from moderate and continued evacuations. Hence their celebrity in the treatment of some forms of dyspepsia and

hypochondriasis, chlorosis, chronick hepatitis, jaundice, and in scrofula.

When these waters are impregnated with carbonick acid, which they frequently are, they become more grateful, and sit easier on the stomach. When they have an impregnation of iron, they acquire tonick powers, and more efficacy as remedies in amenorrhœa and the other chronick diseases in which this metal is employed.

Sea water, in strict chemical arrangement, must be regarded as belonging to the class of saline mineral waters, as it holds dissolved merely various neutral salts, chiefly muriate of soda and of magnesia, and sulphate of soda and magnesia with a little sulphate of lime. It much exceeds, however, in the extent of impregnation, any common mineral water. Its medicinal powers are similar to those of the saline mineral waters; from the extent of its saline impregnation it is more active as a cathartick, and this renders it more stimulating than fresh water as a bath.

Chalybeate mineral waters owe their characteristick properties chemically and medicinally to an impregnation of iron. The oxide of iron is almost uniformly held dissolved by carbonick acid, the acid being usually in excess; in a few mineral waters, sulphate of iron is present; but these are rare, and are in general too active to be well adapted to medicinal use. Chalybeate waters have a peculiar styptick taste; they are transparent when taken from the spring, but when exposed for some time to the air, a pellicle forms on the surface, and a quantity generally minute of ochrey sediment subsides, the water at the same time losing its taste. This change is accelerated by heat.

Chalybeate mineral waters are remedies of considerable activity and power. They act as tonicks, increasing the strength of the system, raising the force of the circulation, giving tone to the digestive organs, augmenting muscular vigour, and promoting the excretions. They are of course employed in those diseases in which iron is principally used, amenorrhœa, chlorosis, some states of menorrhagia, leucorrhœa, dyspepsia, scrofula, and various forms of chronick debility. And as iron always succeeds best when given in small doses, and in a state of considerable dilution, the chalybeate waters afford the best form under which it can be prescribed, that which is at once attended with least irritation, and from which the greatest benefit is obtained. The powers of these waters,

too, are often aided by the presence of other ingredients. The impregnation of carbonick acid, when it is present in excess, gives them a grateful stimulant quality, which is exerted on the stomach ; and saline substances communicate to them an aperient power.

It would be foreign to the object of this sketch to attempt a particular history connected with the various celebrated mineral springs, so much resorted to on the European continent, but some account of the principles and medicinal properties of those of our own country cannot fail of being acceptable, since the most serious consequences frequently result from an indiscriminate employment of these waters.

The Ballston mineral waters are those most celebrated in the United States ; and the following is the result of their analysis, by an eminent French chemist.

1. Carbonick acid, three times its volume.		
2. Muriate of soda,	31	grains.
3. Super-saturated carbonate of chalk,	22	grains.
4. Muriate of magnesia,	12½	grains.
5. Muriate of chalk,	5	grains.
6. Carbonate of iron,	4	grains.

To the preceding analysis, published in an excellent periodical work, the American Medical and Philosophical Register, professor Hosack, of New York, has subjoined some valuable "observations on the use of the Ballston mineral waters in various diseases."

"The Ballston waters have been long known to yield a great quantity of *fixed air*, and to hold in solution a large portion of *iron*. By the analysis referred to, it appears that they yield a much larger proportion of fixed air, and that they contain a greater quantity of iron, than any other mineral water that has hitherto been discovered, not excepting that of Vichy, one of the strongest chalybeate waters in Europe. But it appears, that they also contain another substance, viz. the *muriate of lime*, which, with the other ingredients with which it is associated, promises to be of great and extensive utility.

"We are accordingly from this analysis induced to ascribe more virtues to the Ballston waters than physicians have generally believed them to possess. Although much is due to exercise, change of air, and an agreeable occupation of the mind, which the amusements of watering

places usually afford, I have no doubt, from the sensible effects produced upon the system by the waters themselves, that they also are productive of great good in a variety of diseases, some of which I shall now briefly enumerate.

"1st. From the effects of the Ballston waters, as a strong *chalybeate*, they may be employed with advantage in most diseases of debility, whether directly or indirectly such. But in those complaints which are attended with an increased excitement of the whole system, or with local inflammation, they are manifestly prejudicial. These principles are deducible from the qualities of the waters alone; but they are also confirmed by the experience and observation of physicians who have attended to their operation.

"Accordingly in *intermittent* fever, *dropsy*, *dyspepsia*, *hypochondriasis*, and *hysteria*, connected with, or proceeding from debility of the digestive organs; in *paralysis*, *chronick rheumatism*, *gout* in its chronick state, *chlorosis*, *fluor albus*; in *suppression* of the *menses* when arising from weakness, in worms, and in other diseases of debility, whether of the intestinal canal, or of the whole system, the Ballston waters have been long and justly celebrated. On the other hand, in a plethorick state of the system as in *pregnancy*, in *consumption of the lungs*, *inflammation of the liver*, *acute rheumatism*, *dysentery*, and other diseases of an *inflammatory* nature, in which they are oftentimes resorted to, they invariably do injury. We may, perhaps, except from this remark a *species of consumption* which arises in females about the time of puberty, in which, from want of energy in the system, menstruation does not take place at the period in which it usually appears; dyspepsia ensues, followed with general irritation of the nervous system, pain in the breast, cough, sometimes hæmorrhage from the lungs, and ultimately terminating in confirmed consumption. These consequences have frequently been prevented by a course of iron, and vegetable tonicks, aided by generous diet, and exercise, especially riding on horseback. Under similar circumstances I have no doubt that the Ballston waters may be serviceable in this species of phthisis in its incipient state; but they should never be employed in diseases of this nature, without the advice of a physician.

"2. From the *saline impregnation* of these waters, and their operation upon the urinary organs as well as by perspiration, they are indicated in diseases of the *kidneys* and

bladder, in *gout*, *chronick rheumatism*, and *eruptions* upon the skin, all which diseases are most frequently produced by, or connected with a morbid condition of the fluids, and an impaired state of the secretions. In these complaints, I have repeatedly prescribed these waters with the best effects.

" But according to the foregoing analysis, they contain an ingredient of great value besides those already enumerated; I mean the *muriate of lime*. It appears upon the authority of Dr. Beddoes, Dr. R. Pearson, Dr. Wood, and Dr. Schraud of Vienna, that this substance has lately been discovered to be a remedy for *scrofula*, which hitherto has been the opprobrium of our profession, It is true, cases have been recorded by Russell and others of the cure of this disorder by the use of sea water. But as it has been ascertained by chemists, that the muriate of lime enters into the composition of sea water, it is very possible that much of the efficacy of the latter, in that disease, may be derived from the muriate of lime which it has been found to contain.

" But as scrofula is usually attended with a general debility of the system, as well as a morbid condition of the fluids, the Ballston waters will probably be found peculiarly serviceable, inasmuch as they possess the means of invigorating the system, at the same time that they contain the antidote to the peculiar virus of that disease.

" But to obtain the benefits of the Ballston waters in any of the diseases which have been noticed, it is necessary that in the use of them, as it regards the time of taking them, the quantity taken, the stage of the disease, and other circumstances which must govern their exhibition, the directions of the physician are indispensably necessary. As well might the patient make use of any other article of the materia medica without medical advice, as drink these waters in the manner in which they are usually taken. It is but a short time since, a very valuable life was destroyed by the imprudent use of them during a state of pregnancy. A few days ago I was consulted by two gentlemen who had left the springs much worse than they had gone to them. The one laboured under dyspepsia, attended with habitual costiveness. Neglecting to relieve his bowels, he commenced the use of the waters; the consequences were, an aggravation of his disease, followed with fever, acute pain in the head, and other symptoms of general excitement. The other person referred

to, had come from Virginia, on account of an obstinate chronick diarrhœa, attended with great debility, and general emaciation. Without advice he immediately began to drink the waters to the quantity of several quarts daily. The consequences may be readily imagined; an increase of his disease, and a degree of debility from which he with difficulty recovered."

OF THE WATERS OF STAFFORD SPRING IN THE STATE OF CONNECTICUT.

The waters of Stafford spring have been subjected to a partial analysis by the late Dr. Samuel Willard.

Though far from being complete, for the want of proper agents or tests, the results of his experiments favour the conclusion, 1st. That "iron is the prevailing ingredient in the water,—that it is held in solution by the carbonick acid,—that when the water is exposed to the action of the atmospherick air, or is acted on by heat, the acid is extricated, and the iron precipitated,—the purple colour struck by the vegetable astringents, and by distilled spirits—the precipitate produced by the caustick fixed alkali, and the blue tinge communicated to the water, by calcareous and alkaline prussiates all indicate the presence of iron.

"2d. That the water is also impregnated with the sulphuretted hydrogenous gas, its sulphureous smell, its possessing the property of blackening silver, and its receiving a green tinge from the admixture of vegetable purple juices, may be considered as proofs.

"3d. That the water contains aluminous and magnesian earth, its effects on soap, its effervescing with the sulphurick acid, when deposited as a sediment, and the new combination which takes place on the admixture of that acid, induce a belief of this fact."

A SHORT ACCOUNT OF THE ARTIFICIAL MINERAL WATERS IN THE UNITED STATES.

Taken from Conversations on Chemistry.

The extensive utility of many of the natural mineral waters has been long established by the experience of mankind, and sanctioned by the opinions of the first medical practitioners of every enlightened country.

The accurate analysis of all the most important and celebrated mineral waters has been accomplished by men competent to the task; and we are thus informed not only concerning the *nature*, but the *proportion* of the ingredients which they contain. They are either *solid substances*, such as water can dissolve, or *gases*, capable of being combined with this fluid. To both of these the mineral waters owe their medicinal powers, and to the latter alone, and *chiefly to the carbonick acid*, their peculiar activity, briskness, and pungency.

In the manufacture of artificial mineral waters, the original water is perfectly imitated, by the addition of all the ingredients in the proper proportions; and the gas, by a peculiar and very powerful apparatus is afterwards forced in, till the waters acquire a degree of briskness and activity far surpassing any thing which they ever exhibit in nature.

The impression, entertained by some, that a perfect imitation of the native mineral waters is impossible, is therefore equally contrary to the decisions of good sense, as it is repugnant to experience; for in London, in Paris, and in many other great towns, artificial mineral waters are thus fabricated; and used to great extent.

In the artificial waters, we always have it in our power to leave out noxious, or useless ingredients; to substitute others, and to vary the proportions at pleasure. Every species of mineral waters whatever can be prepared by art; but the principal ones that have been attempted in this country, are the Ballston, Soda, and the Seltzer waters.

BALLSTON WATER.

The Ballston water is well known in the United States as a gentle cathartick; an active diuretick; a remedy against gravelly complaints; a tonick to the stomach, and generally to the system; not to mention its efficacy against rheumatick and cutaneous complaints, when applied externally, as well as internally. It remains to be added only, that the artificial Ballston water is found by experience to produce the effects of the natural water; it is, however, more powerful, and therefore an equal quantity produces more marked effects.

SODA WATER.

The soda is not an exact imitation of any natural water, but has been directed by medical men as a remedy in a number of common and troublesome complaints. It is ordered in the pharmacopœias and dispensatories, and their prescriptions should be followed in this manufacture. It is a complete remedy against sourness of the stomach, commonly called heartburn; and in most cases of indigestion and weakness of the stomach it is very useful; gradually restoring the appetite, and with it the tone of the organ. It is a preventative of many of the diseases of the stomach and bowels, which proceed from acidity; and for the same reason it often removes or prevents the sick headache. As a palliative, and even a remedy, in some cases of urinary calculi and gravelly complaints, it is preferable to the Ballston water. It may prevent, arrest, retard, or remove the complaint, according to circumstances.

The soda water is also a very refreshing, and to most persons a very grateful drink, especially after heat and fatigue; and may be made a complete substitute for the beverages of which ardent spirits form a part. With wine and sugar it is very grateful.

SELTZER WATER.

The Seltzer water has long been known, and is one of the most famous of the natural mineral waters of Europe. On account of its agreeable taste and exhilarating effects, it is largely used at table, and as a beverage at all hours. It is a diuretick, and possesses considerable efficacy in nephritick and urinary complaints. It is very useful against bilious and dyspeptick affections, and in many cases of cutaneous eruptions. It possesses a peculiar power of allaying feverish irritation, and has done much service in slow hectick fevers. It mixes well with milk, and is thus used with advantage by hectick patients. It is used also with sugar and wine.

The manufacture of mineral waters upon correct chemical principles, was undertaken in New Haven, Connecticut, about three years ago; and during the last summer, a publick establishment for this purpose was opened in the same town, under the direction of professor

Silliman. An establishment of the same kind, and under the same direction, was effected in New York in April of this year, (1809,) by Noyes, Darling, and Co. Fountains of Ballston, Soda, and Seltzer waters were opened in the bar of the Tontine coffee house. The cisterns are placed in the cellar, and the waters are conveyed into the bar in block-tin tubes, which pass up into mahogany pillars, crowned with gilt urns, lettered with the names of the respective waters. The pillars, with their urns, stand a foot apart, and the middle one is raised above the others; silver stop-cocks inserted into the sides of the pillars, give the whole much neatness and richness of appearance.

The proprietors of this establishment intend, as we understand, to open fountains at the city hotel, in the month of May, in a spacious room, fitted up and ornamented in a handsome style, and adapted to the accommodation of ladies as well as gentlemen.

The Ballston and Seltzer waters are prepared according to an accurate analysis; and in order to give the soda water its proper efficacy, it is made with the full proportion of soda directed by the dispensatories. The waters are bottled for exportation, in any quantity demanded.

Soda water has been made in New York by Mr. Usher, for a year or more, and has had a good reputation and an extensive sale. It has been sold from a fountain, and in stone bottles. We understand that he is about to extend his establishment. There have been, for some time, manufactories of mineral waters in the city of Philadelphia, and we are informed that these waters have been extensively used.

To the preceding statement it remains to be added, that a publick establishment of a similar nature has been introduced into the town of Boston, by Mr. John P. Whitwell. The soda and other waters which he manufactures have acquired considerable reputation, and proved extremely salutary and useful. From the great attention and exertions of the proprietor, very satisfactory and beneficial effects have been derived, and the utility of his undertaking is becoming more and more extensive and important.

I extract the following from the Emporium of Arts, &c. by Thomas Cooper.

"The best method of combining the Seltzer water with a laxative proportion of the purgative salts is the following, which will enable every body to make, at will, a mineral water, impregnated with cathartick qualities in any proportion that the palate will bear, or the bowels will require, combined with the lively, sparkling qualities of the Seltzer water. Take of super-carbonate of soda, or even the common carbonate, twenty grains, of the common carbonate of magnesia as much, put them in a strong black quart bottle; fill it nearly, but not quite full of water; having previously ready a cork that will fit it. Pour in the quantity of strong vitriolick acid, that you know from previous experiment will barely neutralize that quantity of saline matter. Cork the bottle, and tie down the cork instantly. The carbonick acid gas will thus be combined with a solution of Glauber's and Epsom salts, which must be kept in a cool place. In the same manner the dose may be altered or diminished, or sulphate of iron in the proportion of three or four grains may be added if the symptoms of the patient require it, and a mineral water produced more efficacious than any that nature presents to us. As to the aerated waters generally, I am of opinion that every family should have an apparatus of the kind, in order to make them at any time, for the purpose of medicine and salutary beverage. I found them in a recent complaint of more service than any other preparation. Owing to extreme debility, no medicine or food would stay on my stomach until I drank the Seltzer and soda waters; and I am of opinion, that by their use, sickness may be avoided, and of course, health preserved." JAMES CUTBUSH.

No. II.

MEDICAL PRESCRIPTIONS.

THE principal objects designed to be attained by the composition of medicines, are, to communicate an agreeable taste or flavour; to give a convenient form; to correct the operation of the principal medicine, or obviate some unpleasant symptom it is liable to produce; to promote its action, by the additional article exerting one

of a similar kind; to obtain the joint operation of two remedies, having different powers; or to alter their usual effects, by the power which one may have of modifying the action of another.

A prescription has been usually divided into four parts, which compose it,—the *basis*, or principal article; the *adjuvans*, or that designed to promote the action of the former; the *corrigens*, or that which is intended to correct its operation, or obviate any unpleasant symptom which it may be apt to produce; and the *constituens*, or that which gives to the other ingredients consistence or form. These are not necessarily present in every formula; nor is the division of much importance, except as perhaps affording the best principle for regulating the order in which the ingredients of a prescription should be enumerated.

The following are the principal circumstances to be attended to in forming a prescription.

1st, Simplicity should be attained, as far as is consistent with the objects of the prescription. Nothing ought to enter into the composition which does not add to its virtue, render it less ungrateful, give it a convenient form, or which is not necessary to conceal any particular ingredient; and, in general, the practice of accumulating a number of articles in one prescription is to be avoided.

2dly, Substances, it is evident, ought not to be mixed together, which are capable of entering into chemical combination, or of decomposing each other, unless it be with the view of obtaining the product of the combination, or decomposition, as a remedy.

3dly, Those mixtures are also to be avoided, in which one medicine, by its peculiar action on the stomach or general system, modifies and changes the action usually exerted by another, unless where the object is to obtain the effects of that modified operation.

4thly, The errour of contra-indication is to be guarded against, or those medicines ought not to be combined, the virtues of which are not merely different, but are, in some measure, opposed to each other.

5thly, The ingredients which are to be mixed, must be such as will mix properly together, so that the form in which the remedy is designed to be exhibited, may be easily obtained and preserved.

Lastly, The form under which a medicine is prescribed, must be adapted to certain circumstances; principally to

the nature of the disease, the nature of the remedy itself, and, as far as may be possible, to the taste of the patient.

The doses of medicines are not reducible to any general rules, from their general similarity of operation, or any other circumstance. The principal circumstances by which they are influenced are, Age, Sex, Temperament, Idiosyncrasy, Habit, and Disease.

Age.....From infancy to manhood, a larger dose of any medicine is requisite to produce its effect, in proportion to the advance in life. From manhood to old age, there is a similar gradation with regard to diminution of dose, though in a much less proportion than that which regulates the increase. The following table has been supposed to show these proportions.

TABLE.

Let the dose for a person of middle age be . .	1 or 1 drachm.
For one from xiv to xxi years, it will be . .	$\frac{2}{3}$ or 2 scruples.
. . . . . vii to xiv, ...	$\frac{1}{2}$ or half a dr.
. . . . . iv to vii, ...	$\frac{1}{3}$ or 1 scruple.
. . . . of iv years of age, ...	$\frac{1}{4}$ or 15 grains.
. . . . . iii, ...	$\frac{1}{6}$ or half a scr.
. . . . . ii, ...	$\frac{1}{8}$ or 8 grains.
. . . . . i, ...	$\frac{1}{12}$ or 5 grains.

Sex.....Women, in general, require smaller doses of any medicine than men, a difference probably owing to their greater sensibility from their habits of life.

Temperament.....Those of the sanguine temperament are supposed to be more affected by medicines, and therefore to require smaller doses than those of the phlegmatick or melancholick; but in what has been said on this subject, there is so much uncertainty, that little reliance can be placed on it.

Idiosyncrasy.....This denotes that disposition in individuals to be affected by certain causes, in a manner different from the generality of mankind. Such idiosyncrasies are observed with regard to medicines, as well as to other agents; and, where they are known, require to be attended to by the prescriber.

Habit.....This has an important influence on the operation of medicines. In general, they lose some of their power by having been long continued. This is particularly the case with all strong stimulants and narcoticks, and is even observed, to a certain extent, in some of the

other classes of the materia medica. In a few instances, the reverse has been supposed to hold true.

Disease.....This has an influence on the doses of medicines not less important; the susceptibility to external impressions, and to action, being much varied in morbid affections, and the operations of remedies of course being modified by such variations. The state of susceptibility being in general apparent, when it varies much from the healthy standard, the doses of the medicines administered are easily regulated.—*Murray*.

No. III.

ON THE NATURE AND MEDICINAL USES OF THE GASES.

By a Fellow of the Massachusetts Medical Society.

The term gas, introduced into the nomenclature of chemistry, by Van Helmont, is synonimous with air, and applied to a class of bodies, invisible, highly attenuated, compressible, and permanently elastick at the common temperature of the atmosphere, and the lightest of substances, whose specifick weight is susceptible of demonstration.

Every species of gas owes its form to the calorick with which it is combined. By the introduction of this agent, the particles which constitute the basis of the air, are made to recede to a greater distance from each other, cohesive attraction is destroyed, and a repulsive power is acquired, in consequence of which, they would fly off to an indefinite distance, were it not counteracted by a proportional external pressure. By the abstraction of calorick to a certain degree, the distance between the particles of the air or gas is diminished, they are still capable of moving freely over the surfaces of each other, although cohesive attraction be so far augmented as to constitute them liquids. Hence, as the airs obviously owe their specifick forms merely to the quantity of calorick with which they are united, it has been inferred by chemists, that they are formed by the solution of certain unknown bases in heat. For example, the term *oxygen* is applied to a substance of peculiar properties, which, by its union with calorick, is rendered capable of assuming the form of an invisible, inodorous, insipid, permanently

elastick, and compressible fluid, denominated *oxygen gas*. When this air or gas exerts an attraction for other substances, and enters into combination with their particles, the oxygen, or the base alone, is the subject of the change, and the other principle, the calorick, is evolved or becomes sensible. Hence the origin of the heat during the transition of oxygen from the aeriform to the solid state. The same observations are equally applicable to the other species of gases. By the diminution of the capacity of an air for calorick, even without altering its form, by simple compression, a quantity of heat may be evolved, sufficient to produce, by a peculiar arrangement, the ordinary effects of combustion. Of the precise nature of the bases of the different gases, we are still ignorant, for no attempts to obtain them, independent of their combinations, have yet proved successful.

The difference between gas and vapour is the property, possessed by the former, of remaining permanently elastick (with the single exception of the oxygenized muriatick acid gas*) at the common temperatures of the atmosphere, while the latter, though it retain its elasticity for a time, is ultimately condensed, and restored to the state of a liquid.

The gases are susceptible of their peculiar form at very low temperatures, for the abstraction of calorick to the greatest extent observed in nature, or produced by art, has never been sufficient to deprive them of their elasticity, and reduce them to the state of liquids, or of solids: on the contrary, in the formation of vapour, the temperature of the liquid is augmented above that of the surrounding air, it rises in the atmosphere, where its calorick, from its repellent power or tendency to equilibrium when accumulated in a body, is gradually abstracted, its particles again approximate toward each other, and it reassumes the form of liquid. Hence, says Mr.

* Gaseous ammonia is another exception to the general observation, that the airs are incapable of undergoing a change of form by a reduction of temperature. This abstraction of heat, however, must be great, and is to be effected by art. According to the experiments of Guyton, ammonia retains its elastick form at any temperature above 56°, but below that point it is converted into a liquid, an effect ascribed by Mr. Murray, to the presence of water, with a portion of which, that gas is always found strongly combined. It reassumes the aerial form as the temperature rises.

Murray, "the distinction between gas and vapour is merely relative, and arises from the difference of temperature, at which they were formed."*

In the enumeration of the different species of the extensive genus of gases, we shall confine ourselves to the description of the properties of those, which, in consequence of their peculiar action on the nervous system, and their well known influence in exciting or depressing the vital powers, have been lately introduced as a distinct class of remedies, into the materia medica. The observations of Lavoisier, confirmed by the more extensive and hazardous experiments of Mr. Davy, have sufficiently demonstrated, which indeed was thought probable a priori, that the different species of airs, when taken into the lungs, produce very powerful effects on animal life. The respiration of some of them is accompanied with all the effects of increased excitement. The pulsations of the heart and arteries are accelerated, respiration is hurried, the brain labours with intense thought, new ideas and images present themselves to the imagination, and produce new combinations and associations, a propensity to muscular motion, almost irresistible, is excited, and the whole frame glows with a sense of "pleasurable existence."† The breathing of others, on the contrary, is followed by vertigo and sickness, the senses grow less acute, a painful sensation of stricture across the chest is produced, respiration becomes irregular and laborious, and the pulsations of the heart almost imperceptible, the wish and even the power of muscular motion is for a time extinguished, and the vital powers of the system slowly recover from the almost annihilating influence of these invisible agents. Hence it is obvious, that the airs are capable of acting as remedies in two ways, either by exalting or by depressing the vital powers of the constitution. Of the first class there exist but two species, oxygen gas and nitrous oxide gas.

1. Oxygen gas.

This gas, generally obtained from the black oxide of manganese by the application of heat, is an invisible, inodorous, insipid, permanently elastick fluid, rather heavier than atmospherick air, and characterized by the property of eminently supporting the processes of respi-

* Murray's Chemistry, vol. ii. p. 10.

† Davy's Researches.

ration and combustion. As the capacity of asmospherick air to continue these actions has been sufficiently demonstrated to depend on the oxygen it contains, it was reasonable to suppose, that, when respired pure and undiluted, it would have no inconsiderable influence in increasing the activity of the vital powers. The experiments, however, of Mr. Davy prove that this stimulant effect is not so positive as might be inferred, for on breathing from and into a bag containing twenty quarts of oxygen gas, nearly six minutes, the only deviation from his usual standard of health, perceptible, was an increased hardness of the pulse, and an oppression at the chest analogous to that arising from the want of fresh air.* It is probable that during the respiration of this air the system is excited, partly by a stimulating quality imparted to the blood, and partly by the more direct application of the stimulant to the nervous expansions on the membranes of the lungs. The diseases, in which oxygen gas has been administered medicinally, are those of a chronick nature, where the various functions of the system are languid and debilitated. In these it has been respired always more or less diluted with atmospherick air, in the quantity of from one to two quarts daily, according to the effects produced by its inhalation.†

2. Nitrous oxide gas.

This interesting compound, the effects of which on the human system were first discovered by Mr. Davy, is formed by the union of thirty-seven parts of oxygen and sixty-three of nitrogen. It is a product of art, and is obtained in the greatest purity by the decomposition of the nitrate of ammonia by heat. The degree of temperature must be regulated by the texture of the salt. In order to obtain it with ease from the compact nitrate, the temperature should be preserved between the 340° and 430° Fahrenheit; the decomposition of the fibrous nitrate is effected between 400° and 450°. The products of this distillation are water and nitrous oxide gas. The theory of the formation of these substances is obvious. The hydrogen of the ammonia combines with a portion of the oxygen of the nitrick acid, and forms water, while the remaining oxygen unites with the residual nitrogen both of the ammonia and acid, and produces the nitrous

* Researches. p. 474.

† Murray. Mat. Med. vol. ii. p. 236—7.

oxide, which passes over into the receiver in the form of gas, carrying with it a portion of the salt which may have escaped decomposition, from which it may be freed by standing a short time in contact with water.

The effects on the system, resulting from the respiration of this gas, are very remarkable, and are amply detailed in the "Researches" of Mr. Davy. It operates like a very powerful and general stimulus on the vital powers. Objects appear to the subject under its influence magnified and of a dazzling lustre. The sense of hearing is often painfully acute; the whole frame glows with a consciousness of pleasurable sensation. If the inhalation be continued the patient nearly loses all connexion with the objects which surround him; he gradually passes into a state of delirium, when the various faculties of the mind act with unknown and uncontrollable energy; respiration is hurried, the pulse is accelerated, and an irresistible propensity to muscular motion is evinced, which exhausts itself in laughing, stamping, exclamations of joy, and walking. These effects continue for a few minutes, and at length gradually subside, though the impression on the system often gives a charm to existence for many hours. Unlike the operation of other stimuli, the respiration of the nitrous oxide gas is unattended by any exhaustion or debility of the vital powers; and although the stimulation have perhaps amounted to a degree, beyond which the functions of the body might remain permanently impaired, it passes off almost insensibly, and leaves no unpleasant traces of its powers. "A substance capable of acting in such a manner, we might suppose, would prove one of our most valuable remedies. The transient nature of its operation must undoubtedly limit its medicinal efficacy, but still in diseases of extreme debility we seem justified in expecting from its exhibition the most beneficial effects. The dose which is necessary to produce its peculiar effects varies from four to nine quarts, which may be breathed pure or diluted with atmospherick air. It cannot be breathed for more than four minutes and a half, insensibility being induced."*

The gases inimical to animal existence constitute a much more extensive class than the preceding, and appear to be destructive of life, either by simply excluding

* Murray's Mat. Med. vol. ii. p. 288—9.

oxygen from the lungs, or by some positive action on the nervous system. All the airs, with the exception of oxygen and nitrous oxide, may be supposed to produce their effects in one of these modes. The administration, however, of these has been confined to hydrogen, nitrogen, carbonick acid, and carburetted hydrogen gases; the two first of which are negative, and the two last positive, with regard to their action on the human system.

1. Hydrogen gas.

For the purposes of respiration this gas should always be procured by the decomposition of water transmitted in vapour over the surface of ignited iron. "In a pure state, if the lungs have been previously emptied as much as possible of atmospherick air, it cannot be breathed above three quarters of a minute. It quickly occasions a giddiness and sense of suffocation; the countenance becomes livid, and the pulse sinks rapidly; but, when diluted with two thirds or an equal bulk of atmospherick air, it can be safely breathed; nor does it appear to produce any very important effect. It occasions some diminution of muscular power and sensibility, and of the force of circulation. It has been used in catarrh, hæmoptysis, and phthisis, but its powers seem merely those of a palliative."† Hence it may be inferred that hydrogen, like nitrogen gas, operates only by the exclusion of oxygen, and not by any positive influence on the nervous system.

3. Carbonick acid gas.

This aerial fluid has acquired some celebrity in medicine, and has often been administered by respiration; by the introduction of substances into the stomach from which it is easily disengaged; and as an antiseptick in cases of topical gangrene. It may be obtained with facility, and in a state of purity by the exposure of carbonate of lime to a strong red heat in an iron tube, and collecting the gas over water. By the experiments of Mr. Davy, it appears to produce an acid taste in the mouth and fauces, and a sense of burning at the top of the uvula. When arrived to the upper part of the trachea, it is instantly stimulated to such a degree as to excite a spasmodick constriction of the glottis, and render it incapable of transmitting a particle of the air into the lungs. The same effects are produced even when diluted with an equal bulk of atmospherick air. But when the proportion of the two

† Murray's Mat. Med.

gases is about three quarts of carbonick acid to nine of atmospherick air, the mixture may be breathed for a short time with impunity. The symptoms resulting from its respiration in this way, are those of a weak sedative, producing a slight degree of giddiness, and an inclination to sleep. The effects, however, are temporary, and rapidly disappear after ceasing to breath the air.

This gas has been highly recommended in the cure of diseases of increased excitement, particularly phthisis pulmonalis; and patients have even been persuaded to visit daily, and even to reside in those places, particularly brew-houses, in which there is a constant copious production of this depressing power. There are few cases on record, in which it has done more than act like an anodyne to diminish sensibility, and thus smooth the path to the grave.

This substance has perhaps proved more permanently useful as a local application to phagedenick ulcers and incipient gangrene, conveyed to the part through the fermenting poultice, from which it is extricated, or by means of a flexible tube, in its pure uncombined state.

4. Carburetted hydrogen gas.

This is undoubtedly the most deleterious of all the gases which have been employed to diminish the morbid actions of the animal system. It is usually prepared by passing the vapour of water over the surface of charcoal, heated to ignition in an iron tube. The fluid is decomposed; its oxygen enters into combination with a portion of the carbon, and produces carbonick acid, while the hydrogen thus liberated unites with the remaining carbon, forms carburetted hydrogen gas, which, mixed with the other aerial product, passes over into the receiver, and is freed from the latter by agitation over lime water. Respired in a diluted state, it produces very alarming effects on the vital powers, and when pure almost immediate death. The rashness of Mr. Davy, in attempting its respiration, had nearly cost him his life. When diluted with atmospherick air, in the proportion of three quarts of the former to two of the latter, its inhalation was followed by a slight giddiness, pain in the head, and momentary loss of muscular power, attended by a quick and feeble pulse. When pure, however, the effects were much more positive and alarming. "After a forced exhaustion of my lungs," says Mr. Davy, "I made three inspirations and expirations of the hydro-carbonate. The first inspiration pro-

duced a sort of numbness and loss of feeling in the chest, and about the pectoral muscles. After the second inspiration, I lost all power of perceiving external things, and had no distinct sensation, except a terrible oppression on the chest. During the third expiration this feeling disappeared. I seemed sinking into annihilation, and had just power to drop the mouth piece from my unclosed lips."—"Putting my finger on my wrist, I found my pulse thread-like, and beating with excessive quickness." The system was a long time in recovering from the effects of this experiment. From the action of this gas on his nervous system, it was inferred by Mr. Davy, that its operation is directly sedative, or productive of a diminution of vital powers and debility, without previous excitement.

The medicinal effects of this air are most obvious in phthisis pulmonalis; and it is to this disease, that its administration has in general been directed. According to the experiments of Dr. Beddoes, it has in many cases relieved the symptoms and suspended the disease. Its respiration, however, must be regulated with caution. The gas should at first be highly diluted, and its strength gradually increased, in proportion as the system becomes accustomed to its action. The quantity to be respired should vary from one to four quarts a day.

No. IV.

MEDICAL ELECTRICITY.

The application of this subtile fluid to medicinal purposes, was thought of, soon after the discovery of the electrick shock. At the first introduction of electricity as a remedy, it was very highly celebrated for its efficacy in a number of diseases; and after various turns of reputation, its medical virtues seem now to be pretty well established.

The medicinal operation of electricity may be referred to its stimulant power. It produces forcible contractions in the irritable fibre; excites therefore to action if duly applied; and when in excess, immediately exhausts irritability. It possesses the important advantage of being easily brought to act locally, and of being confined to the

part to which it is applied, while it can also be employed in every degree of force.

Electricity is applied to the body under the form of a stream or continued discharge of the fluid, under that of sparks, and under that of shock; the first being more gentle, the second more active, and the last much more powerful than either of the others. The stream is applied by connecting a pointed piece of wood, or a metal wire, with the prime conductor of the electrical machine, and holding it by a glass handle, one or two inches from the part to which it is to be directed. A very moderate stimulant operation is thus excited, which is better adapted to some particular cases, than the more powerful spark or shock. The spark is drawn by placing the patient on the insulated stool, connected with the prime conductor; and, while the machine is worked, bringing a metal knob within a short distance of the part, from which the spark is to be taken. A sensation somewhat pungent is excited, and slight muscular contractions may be produced; these effects being greater or less, according to the distance at which the knob is held, if the machine be sufficiently powerful. The shock is given by discharging the Leyden phial, making the part of the body, through which it is intended to be transmitted, part of the circuit. The sensation it excites is unpleasant, and the muscular contractions considerable, if the shock be moderately strong.

The general rule for the medical employment of electricity, is to apply it at first under the milder forms, and gradually to raise it, if necessary, to the more powerful. Mr. Cavallo, who has published the latest and best treatise on medical electricity, entirely disapproves of giving violent shocks, and finds it most efficacious to expose the patient to the electrical aura discharged from an iron or a wooden point; or, if shocks be given, they should be very slight, and not exceed thirteen or fourteen at a time. In this way he recommends it as effectual in a great number of disorders. The patient may be electrified from three to ten minutes; but, if sparks be drawn, they should not exceed the number of shocks abovementioned.

Rheumatick disorders, even of long standing, are relieved, and generally quite cured, by only drawing the electrick fluid by a wooden point from the part, or by drawing sparks through flannel. The operation should be continued for about four or five minutes, repeating it once or twice, every day.

Deafness, except when it is occasioned by obliteration, or other improper configuration of the parts, is either entirely or partly cured by drawing the sparks from the ear with the glass tube director, or by drawing the fluid with a wooden point.

Toothache, occasioned by cold, rheumatism, or inflammation, is generally relieved by drawing the electrick fluid with a point, immediately from the part, and also externally from the face. But when the body of the tooth is affected, electrization is of no use, for it seldom or never relieves the disorder, and sometimes increases the pain to a prodigious degree.

Swellings, in general, which do not contain *matter*, are frequently cured by drawing the electrick fluid with a wooden point. The operation should be continued for three or four minutes every day, and in obstinate cases it is sometimes necessary to persevere in its use for several weeks.

In inflammations of the eyes, the throwing of the electrick fluid, by means of a wooden point, is often attended with great benefit; the pain being quickly abated, and the inflammation being generally dissipated in a few days. In these cases, the eye of the patient must be kept open; and care should be taken not to bring the wooden point very near it, for fear of any spark. Sometimes it is sufficient to throw the fluid with a metal point; for in these cases, too great an irritation should always be avoided. It is not necessary to continue this operation for three or four minutes without intermission, but after throwing the fluid for about half a minute, a short time may be allowed to the patient to rest and wipe his tears, which generally flow very copiously; then the operation may be continued again for another half minute, and so on for four or five times every day.

Palsies are seldom perfectly cured by means of electricity, especially when they are of long standing; but they are generally relieved to a certain degree; the method of electrifying in those cases, is to draw the fluid with the wooden point, and to draw sparks through flannel, or through the usual covering of the parts, if they are not too thick. The operation may be continued for about five minutes per day.

Ulcers, or open sores of every kind, even of long standing, are generally disposed to heal by electrization. The general effects are a diminution of the inflammation, and

first a promotion of the discharge of properly formed matter; which discharge gradually lessens, according as the limits of the sore contract, till it be quite cured. In these cases, the gentlest electrization must be used, in order to avoid too great an irritation, which is generally hurtful. To draw or throw the fluid with a wooden, or even with a metal point, for three or four minutes per day, is fully sufficient.

Cutaneous eruptions have been successfully treated with electrization; but in these cases it must be observed, that if the wooden point be kept too near the skin, so as to cause any considerable irritation, the eruption will be caused to spread more; but if the point be kept at about six inches distance, or farther if the electrical machine be very powerful, the eruptions will be gradually diminished till they are quite cured. In this kind of disease, the immediate and general effect of the wooden point, is to occasion a warmth about the electrified part, which is always a sign that the electrization is rightly administered.

Scrofulous tumours, when they are just beginning, are generally cured by drawing the electrick fluid with a wooden or metal point from the part. This is one of those kinds of diseases in which the action of electricity requires particularly the aid of other medicines in order to effect a cure more easily; for scrofulous affections commonly accompany a great laxity of the habit, and a general cachexy, which must be obviated by proper remedies.

Locked-jaw has in some instances been speedily cured by small shocks passing through the jaws.

Nervous headaches, even of long standing, are generally cured by electrization. For in this disease, the electrick fluid must be thrown with a wooden, and even sometimes with a metal point, all round the head successively. Sometimes exceedingly small shocks have been administered; but these can seldom be used, because the nerves of persons subject to this disease are so very irritable, that the shocks, the sparks, and sometimes even the throwing the electrick fluid with a wooden point kept very near the head, throw them into convulsions.

Amenorrhœa, a disease of the female sex, that often occasions the most disagreeable and alarming symptoms, is often successfully and speedily cured by means of electricity, even when the disease is of long standing, and

after the most powerful medicines, used for it, have proved ineffectual. The cases of this sort, in which electrization has proved useless, are so few, and the successful ones so numerous, that the application of electricity for this disease, may be justly considered as an efficacious and certain remedy.

Small shocks, that is, of about one twentieth of an inch, may be sent through the pelvis; sparks may be taken through the clothes from the parts adjacent to the seat of the disease; and also the electrick fluid may be transmitted, by applying the metallick or wooden extremities of two directors to the hip in contact with the clothes; part of which may be removed, in case they be too thick. Those various applications of electricity should be regulated according to the constitution of the patient. The number of shocks may be about twelve or fourteen. The other applications may be continued for two or three minutes; repeating the operation every day. But either strong shocks, or a stronger application of electricity than the patient can conveniently bear, should be carefully avoided; for by those means, sometimes disagreeable symptoms are produced.

The application of electricity has also been beneficial in other diseases beside the abovementioned; but as the facts are not sufficiently numerous to afford the deduction of any general rules, we have thought not proper to take any particular notice of them. We may lastly observe, that, in many cases, the help of other remedies to be prescribed by the medical practitioner, will be required to assist the action of electricity, which by itself would, perhaps, be useless; and, on the other hand, electrization may often be applied to assist the action of other remedies, as of sudorificks, strengthening medicines, &c. It not unfrequently happens that electricity is relinquished as an unsuccessful remedy, when by a more rigid perseverance a cure might have been effected.

N. B. The substance of the above article may be found in the Encyclopedia, American edition.

No. V.

GALVANISM.

The peculiar power, which is generated, when two metals moistened are in contact, at first named animal electricity, since galvanism, discovered by professor Galvani, at Bologna, has been recently applied as a remedy in various morbid affections. Its effects on the animal system are such as warrant this application. Its activity is shown, by its exciting strong sensations, in sensible parts, and powerful contractions in parts endowed with irritability. These singular phenomena take place in consequence of a mutual communication between any two points of contact, whether more or less distant, in a system of muscular and nervous organs. The extent of this communition may be considered as a complete circle divided into two parts, one of which, comprising the organs of the animal under the experiment, is called the *animal arc;* the other, which is formed by the metals or galvanick exciters, is denominated the *excitatory arc;* and consists of more than one piece of various kinds.

Beside the effect thus produced on the muscles, the impressions made on the organs of sense are equally remarkable. For instance, if a thin plate of zinc be placed on the upper surface of the tongue, and half a crown, shilling, or tea spoon, be laid on the lower surface of the tongue, and both metals after a short space of time be brought into contact, a peculiar sensation, similar to taste, will be perceived, at the moment when the mutual touch happens. A similar perception will result both at the moment of contact, and that of separation, if one of the metals be applied as high as possible between the gums and upper lip, or even under the tongue.

Signior *Volta's* apparatus consists of a number of copper or silver plates, (which last are preferable,) together with an equal number of plates composed of tin, or still better of zinc, and a similar number of pieces of card, leather, or woollen cloth, the last of which substances appears to be the most suitable. These last should be well soaked in water saturated with common salt, muriate of ammonia, or, more effectually, with nitre. The silver or copper may be pieces of money, and the plates of zinc may be cast of the same size. A pile is then to

be formed, by placing a plate of silver on a corresponding one of zinc, and on them a piece of wet cloth or card; which is to be repeated alternately, till the number required be arranged in regular succession. But, as the pieces are apt to tumble down, if their numbers be considerable, unless properly secured, it will be advisable to support them by means of three rods of glass, or baked wood, fixed into a flat wooden pedestal, and touching the pieces of metal at three equi-distant points. Upon these rods may be made to slide a small circular piece of wood, perforated with three holes, which will serve to keep the top of the pile firm, and the different layers in close contact. The moistened pieces should likewise be somewhat smaller than those of metal, and gently squeezed before they are applied, to prevent the superfluous moisture from insinuating itself between the pieces of metal. Thus constructed, the apparatus will afford a perpetual current of animal electrick fluid, or galvanick influence, through any conductor that communicates between the uppermost and lowest plate; and, if one hand be applied to the latter, and the other to the highest metal, a shock will be perceived, which may be repeated as often as the contact is renewed. This shock greatly resembles that given by the torpedo, or *gymnotus electricus:* and, according to the larger size of the metallick plates, the shock will be proportionably stronger. The intensity of the charge, however, is so low, that it cannot penetrate the dry skin; it will therefore be necessary to wet both hands, and to grasp a piece of metal in each, in order to produce the desired effect: its power may be considerably increased, both by an elevation of temperature, and by augmenting the number of pieces that compose the pile. Thus twenty pieces of each will emit a shock that is very perceptible in the arms; if one hundred be employed, a very severe but tremulous sensation will extend even to the shoulders; and, if the surface of the skin be broken, the action of the galvanick influence will be uncommonly painful.

The sensation of a flash, or shock, with this apparatus, does not materially differ from that produced by two simple plates; but it may be effected in various ways, especially if one or both hands be applied in a wet state to the lowest plate of the pile; or any part of the face be brought in contact with a wire communicating with the top piece. Farther, if a wire be held between the

teeth, so as to rest upon the tongue, that organ, as well as the lips, will become convulsed, the flash will appear before the eye, and a very pungent taste will be perceived in the mouth.

Between galvanism and electricity there are so many points of resemblance, that they have been considered as ultimately the same power, or, as the same subtile matter in different states. Whether this opinion be just or not, the effects of galvanism on living matter, are different from those of electricity. The sensation, which the former excites, though somewhat analogous to that produced by the latter, is still dissimilar; the action of galvanism is more extended, both to the nervous and muscular systems, than that of electricity, which is more local in its action. The galvanick excitation produces sensations and contractions in the parts, which, from disease, are insensible to electrical impressions; and the stimulant power, which both exert, appears in galvanism, to be greater in proportion to its intensity, than in electricity; or the sensations and muscular contractions, which the galvanick discharge excites, are more than proportioned to its power of producing electrical phenomena.

The diseases, in which galvanism has hitherto been employed, are principally those of the nervous kind. In paralysis, it has been affirmed to have restored the capability of muscular contraction, and consequently the power of motion. Cases of chorea, tetanus, and some other spasmodick affections, have been related, in which perfect cures were accomplished by its application. It appears, in several instances, to have relieved deafness, especially that species of it arising from torpor of the auditory nerve; and it has been successful in discussing indolent tumours.

Galvanism is applied by connecting two metallick wires with the two extremities of a galvanick battery, and bringing them in contact with the part affected, so that it shall form part of the circuit of the galvanick discharge; the one wire is kept in contact with the part it touches; the other is alternately applied for a moment and removed. If the skin be moistened, the galvanick influence is communicated more readily and effectually; and still more so if a small piece of metallick leaf be laid on the parts to

which the wires are applied. Sometimes even the cuticle has been previously removed by a blister, but the galvanick application is then attended with pain.

No. VI.

AN ABRIDGMENT OF DR. CURRIE'S MEDICAL REPORTS ON THE USE OF WATER.

Dr. Currie has published a work in medicine apparently of the utmost importance, and particularly so to the United States; for whose now reigning disease it flatters us with some appearance of relief, if not of cure. The veracity of the author in all situations, is as well established as his reputation for solid and ingenious talents.

Dr. William Wright, f. r. s. formerly of Jamaica, and well known for his writings in medicine and botany, seems to have furnished a case to our author, which, joined to his own previous opinions, led him to the train of practice and observation of which we are about to give the account. Dr. Wright, while on a voyage from Jamaica, in 1777, being attacked with fever, on the third day of it, ordered three buckets of salt water to be thrown upon himself, which gave him instant relief; and this, being repeated on the two following days, removed every symptom of disease. Another passenger, whose attack from fever had begun on August 9, copied the example, and was restored to health. A seaman, who originally communicated the fever to Dr. Wright, refusing proper assistance, died. Encouraged by these incidents, and finding that Dr. Brandreth, of Liverpool, had employed cold water externally in cases of fever, with happy effects, Dr. Currie resolved upon a series of experiments.

In December, 1787, Dr. Currie, in seven cases of contagious fever, threw cold water from a bucket upon the body of each patient; and the whole recovered. An eighth patient died, with whom the practice was omitted. The cure was *chiefly intrusted to this remedy* in one hundred and fifty-three cases, of which the author kept a register; besides many *subsequent* cases, of which he kept no register, unless where the application failed of success.

The 30th regiment of British infantry, in particular, while quartered at Liverpool, in 1792, afforded him an

opportunity of trying this application with some precision; and the result of the experiment is instructive. A guard-room, prison-room, two sick-rooms, and a cellar, had, by their foulness, either caused or increased a fever, which soon affected a number in the regiment. Dr. Currie being called in, the primary causes of the disaster were removed, and the patients all cleansed. Those whose strength was not greatly reduced, had cold salt water poured upon them; and the rest were sponged over with tepid vinegar. The remainder of the regiment was drawn up in its ranks, and seventeen others who had marks of the disease were separated, and subjected to the cold affusion;* which cut the disease short in all but two of these. Those who were yet well, were ordered to bathe in the sea; being regularly mustered for that purpose. The number infected in the whole was fifty-eight; of whom twenty-six had the disease, by these means, brought suddenly to a close; but in the remaining thirty-two it ran its course. It was fatal, however, only to two; who had been weakened by visiting the West Indies, and by being bled, and who besides had not received the cold aspersion, not having been visited by Dr. Currie till the twelfth or fourteenth day of the disease. The fever broke out about the beginning of June, but no new attack occurred after the thirteenth of that month. The water employed was taken from the river Mersey; having in it 1-32 or 1-33 part of sea salt; and being of the temperature of 58 or 60 degrees of Fahrenheit's, which is our common thermometer.

When Dr. Currie speaks of fever simply, he means the low contagious fever; which frequently is called the nervous, and in certain cases the putrid. fever; being the common fever of England, and prevailing chiefly among the poor, who are most exposed to the causes producing it. Dr. Cullen gives it the name of *typhus;* terming it *a contagious fever; in which the heat is but little increased; the pulse small, weak, and mostly quick; the urine scarcely changed; the functions of the brain and senses much disturbed; and the strength greatly reduced.*

In fevers called *continued*, there is nevertheless (see Dr. Cullen and others) at least one increase and one abatement in each day. This increase of the fever is known

* By *affusion* or *aspersion*, the author means the pouring of water upon a patient, as for example, from a bucket.

[*Compiler.*]

by thirst, restlessness, and increased flushing; and also by the heat in the internal parts of the body, raising the thermometer one or two degrees beyond the average observed during other moments of the fever. As this increase (or paroxysm) usually occurs in the afternoon or evening, Dr. Currie prefers this period (other things being equal) for the cold affusion; thinking it most *safe*, as well as most *useful*, to apply the water at the height of the fit, or immediately after it has begun to decline. But he says, that the remedy may be safely used, *when there is no sense of chilliness present, when the heat of the surface is steadily above what is natural, and when there is no general or profuse perspiration;* which he observes are particulars of the utmost importance.*

During the cold stage of the fever, the cold water nearly suspends the respiration, greatly disturbs the pulse, increases the chill, and seems to bring on the struggles of death; and really would do so, if repeated. The thermometer therefore is never to govern the practitioner, where the chilliness of the patient contradicts its indications. On the other hand, the absence of chilliness is no guide, unless the thermometer concurs to show a heat more than natural. Lastly, profuse perspiration, in fever, must for the time, deter from the operation; and especially in proportion to its continuance. Though perspiration is in itself a cooling process, yet the load of heated bed-clothes may prevent an *internal* diminution of the heat from being immediately perceived. Under these restrictions, Dr. Currie thinks, that the cold affusion may be used at any period of fever; but preferably in the beginning.

The author seems after each affusion to have rubbed the body *hastily* with towels.

The cold affusion generally reduces the heat from two to six degrees of Fahrenheit's thermometer; and the pulse sinks by it from two to above twenty beats in the minute; and in one case, somewhat dubious indeed as to its issue, it fell at least forty beats.

Where the heat is reduced and the debility great, some cordial should be given immediately after the affusion;

* One important caution appears to have escaped both Dr. Currie and his able commentator. That when fevers are complicated, (as they often are in this climate) with pneumonick inflammation, or other dangerous affections of the lungs, cold ablution is inadmissible.—*Compiler.*

and the author thinks that warm wine is the best. In case the affusion produces effects unusually severe, then to the *cautious* use of warm cordials in small quantities, friction, and especially of the extremities, is to be added, and a bladder of hot water applied to the pit of the stomach.

Several examples are given of the effect of the cold affusion in the first, second, third, fourth, and succeeding days of fever. On the first and second days, the disease often instantly vanishes with one aspersion; and sometimes on the third day; but on the fourth day this is rare. Each aspersion, however, instantly removes the symptoms; and a few repetitions of it on the successive returns of the paroxysm, in two or three days happily terminate the disease, with none or trifling aid from medicine.

In advanced periods of the disease, the author commonly employs water only fifteen or twenty degrees below the natural heat of the human body. After the eighth or ninth day he often simply sponges the whole body with tepid vinegar, to which he sometimes adds water. But where the heat has remained considerable, and where the *sole object* has been its removal, he has still persisted in the tepid aspersion.

Hence another limitation occurs to the author's general doctrine; for the cold affusion is to be changed after a certain number of days for the tepid, and the tepid affusion in various cases is to give way after a time to moistening and washing the body.

Since cold, cool, and even tepid water, employed externally, each reduce the patient's heat; we see why this heat should not be too low at the moment, lest two great a chilliness should follow. Hence also the same patient, whose disease has been removed by cold water judiciously applied, would often suffer from repeating the application in his convalescent state. But if we think we perceive why this rude remedy answers so happily at the delicate moment of the hot fit; we are still to inquire, whence it often removes the *whole of the disease*, of which the heat seems to constitute only a part?

Dr. Currie, as might be expected, has extended his trials with water to other species of fever. One species and one alone, he has found in every shape insensible to his great remedy, of aspersion with *cold* water; but this species was generally insensible also to every other remedy, and was *not made worse by cold water*. This fever occurs, he says, chiefly in the winter season; and in per-

sons who are in the flower or vigour of life, and who are also possessed of considerable sensibility of mind, and are in habits of more than ordinary mental exertions. Other particulars of this complaint must be looked for in Dr. Currie; who is the first perhaps who has noticed it, as a distinct species of fever; to which indeed it seems to lay claim, not merely by its refusing to yield to his applications, but by its symptoms; and particularly by the acuteness which prevails in all the senses of the patient, beyond perhaps the state of nature, and certainly beyond what occurs in common fever.

In *intermittents*, the cold affusion with vigorous patients, applied *before* the period of the *cold* fit, has prevented the whole of the fit; but where weakness made the attempt hazardous, the cold fit was suffered to arrive and pass, and the affusion was applied to the hot fit when thoroughly formed. The disease was sometimes cured in the first case; but in the second, there was only a solution of the pending fit; though four or five repetitions of the practice finally removed the disease. In any event, opportunity was given for throwing in medicines.

Dr. Currie has found not only that eruptions on the surface of the skin, but that salivation, are no obstacles to the cold affusion, under the restrictions before mentioned.

A friend of his has tried it also in the first commencement of *scarlet fever* (scarlatina,) and with complete success. The efflorescence on the skin and the affection of the throat were even prevented; which has led Dr. Currie to consider the tendency to these symptoms as being the *effect*, and not the *cause*, of this fever. Dr. Currie having had no late opportunity of treating the scarlet fever in its early stages, has contented himself with prescribing for it in its later stages, immersion in the tepid bath, heated from ninety-two to ninety-six degrees of Fahrenheit.

In the eruptive fever of the *small pox*, Dr. Currie has found a new object for the successful use of the cold affusion; regulating himself as usual by the actual state of the patient's heat, as appearing from the thermometer, provided the indications of the thermometer are confirmed by the patient's *sensation* of heat. In the confluent small pox, after the eruption is completely formed, he is diffident of its benefit. But he is the more anxious to apply it in the eruptive fever, since he says that the assi-

milation of the quantity of contagious matter produced from the first contagion, is invariably found to bear an exact proportion to the eruptive fever. He declares that in the eruptive fever, he has instantly abated the symptoms, however severe, and that the disease has assumed a benignant form. He tells us, that the Chinese are stated to have long followed this practice with success.

Dr. Currie treats of *cold water applied internally* in fevers. He says that in the cold stage, it is never to be employed, however urgent the thirst; which ought only to be gratified in this stage of the fit, or paroxysm, with warm liquids. When the hot stage is fairly formed, and the surface of the body *dry and burning*; cold water, he says, may be drank with the utmost freedom; and if it succeeds in lowering the pulse and heat, as is usual, perspiration and sleep commonly follow. Its effect however is never so powerful, according to his experience, as to dissolve even the existing fit of the fever, and much less the fever itself. But he holds draughts of cold water as a useful auxiliary in these cases, and says that they may be used more freely in proportion as the heat is more advanced above the natural standard. He allows cold water to be drank, though more sparingly, even in the *beginning* of the sweating stage; since it may promote the flow of perspiration; which after it has commenced, seems to be checked, if a fresh *increase* of animal heat occur. But after the perspiration has become general and profuse, the use of cold drink *is* strictly forbidden; the rule being, in all other respects, the same as laid down for cold water used externally.

In case of *injury from drinking cold water*, the author recommends hot water to be applied in a bladder to the pit of the stomach; and small and frequent doses of tincture of opium to be administered, which Dr. Rush recommends in cases of injury from cold water drank in warm weather.

Though Dr. Currie is persuaded that injury has sometimes followed from cold water drunk in hot weather, and from cold bathing used after strong exercise; yet he denies that any inconvenience is *necessarily* to follow. He affirms, that inconvenience arises only for the want of making proper distinctions. In situations where the body, after having been much heated and enfeebled by severe exertions, is losing its surplus heat by perspiration, and in general by a cessation of the exertions which

caused the heat; he allows that cold water, whether applied inwardly or outwardly, may often be injurious and sometimes even fatal. But while the surplus heat is kept up by a continuance of the exertion, he says that cold water may be drank safely in moderate quantities. The same he asserts respecting the cold bath; and therefore he has for some years constantly directed infirm persons to use such a degree of exercise before plunging into the cold bath, as would produce some increased action of the vascular system, with some increase of heat; and thus secure reaction under the shock. It will appear, however, that the patient here ought not to perspire; or if perspiring, ought not to stand still, either dressed or undressed, sufficiently long to become chilled from the effect of the act of perspiration, or from the evaporation following it.

Under the above persuasions our author contends against Dr. Rush; that where the party is warm, *no* attempt should be used to reduce the heat, previous to drinking cold water. It follows however from Dr. Currie's own premises, that no objection occurs either against removing the chill from the water, by means of the sun, of common fire, or of animal heat; or against continuing to exercise for a short time after the draught: and as either of these expedients is simple, it would be well to employ one or both of them; as the sole object in view is quenching the thirst, and not curing a disease upon speculative principles. We may here also observe the benefit of wearing cotton or even woollen next to the skin, where perspiration is probable from hot weather or violent exercise, especially where both are combined; since wet linen aided by evaporation, conducts away the heat of the body so rapidly, in certain situations, as often to occasion severe chills. Few however are the cases, in which it will not be safe and highly advisable to throw off the wet linen, rub or wipe from the skin the matter perspired with something dry, and put on a fresh and dry covering next to the body; as those who have had experience in the case, will cheerfully testify.

As to using the cold bath when the body is warm, there are so many facts on both sides of the question that it requires an expedient to reconcile them; and this Dr. Currie certainly seems to offer. By his means, we perceive whence the Roman youth could plunge in the *course of their daily exercises* into the river Tiber, and yet Alexander suffer from throwing himself into the river Cydnus,

after being fatigued and chilled with perspiration; as well as whence the Russians and others jump from a vapour or hot bath into the snow, or into a cold bath; while merely to sit in a cold stream of air, after violent exercise, is sufficient to bring others, nay the very same people, to the grave. A number of other seemingly contradictory, and yet authentick relations, receive here also a similar solution. Hence we may assure ourselves, that if the waters of the Mississippi never injure those who drink them in summer, whatever be their state as to perspiration or fatigue; it is not owing to the *quality* of these waters, but to their *warmth*, in consequence of their long exposure to the sun. In like manner, if the water issuing newly from the ground in Abyssinia, is harmless in all cases; it is because the spring-water of that country (which every where nearly corresponds with the average temperature of the weather of the place) is never very cold.

But we pass on to new cases of disease.

Before and since the year 1790, the author has witnessed thirteen cases of tetanus (that is, stiffness accompanied at intervals with convulsion, as instanced in the disease known by the name of the locked jaw.) This disease is distinguished into the proper or primary, called idiopathick; and the concomitant or secondary, called symptomatick, being an occasional attendant upon wounds, especially in hot countries. The author, from his later experience, is disinclined to use the cold bath in any of its forms in the *symptomatick* tetanus; unless in the earlier stages of the disease, when the vigour is less impaired, and the disease less rooted. One reason is, that change of posture is required for the purpose, in a case where the mere action of the will on the muscles is often alone sufficient to bring on a general convulsion. He rather prefers wine given in large quantities, a remedy first introduced by Dr. Rush; but wishes it combined with very large doses of opium. Wine, it seems, has in this disorder been given with success also to horses; but it is queried, whether other strong or spirituous liquors would not answer as well. It is observed that the constitution under this disease, powerfully resists the intoxicating quality of the wine and opium. In tetanus also, Dr. Currie has applied pressure, with evident good effect; moistening at the same time the bandages with ether, but taking care lest inconvenience should arise from too great an evaporation,

the natural consequence of ether being exposed to a current of air. In the *idiopathick* or simple tetanus, the author has applied water of an exceeding cold temperature (exhibited in a bath where the effect was sudden, and the limbs could be stretched out,) with a very marked success, though all other applications had failed. Let us observe here, that since to rub in sweet oil has been found a powerful remedy with many, in cases of *cramp* of the external muscles; it might be well always to try it in tetanus, though medical persons often slight it. In any event, those subject to this painful affection of the cramp, especially pregnant women and swimmers, may do well to remember this use of oil. Oily substances may also be tried by the mouth or clyster, in cases of cramp or spasm in the stomach or intestines.

The author has applied a very cold bath to more than one case of insanity, with brilliant success; but it was when the fit was at the highest. The ordinary delirium of fever is acted upon by cold water in different shapes, in common with all the other symptoms of fever.

In children's convulsions, it is also serviceable; stopping the fit, and giving time for other remedies. When the author mentions that convulsions may sometimes arise from worms or other causes; perhaps he ought to have added, that teething is one of these causes, and that John Hunter has given instant relief, by cutting the gum over a young tooth with a lancet. On the whole, Dr. Currie recommends caution in the applications of water in early infancy; sometimes tempering his water, and sometimes only pouring it on, in preference to bathing in it; but making the operation sudden and transient, and providing means ready for securing the re-action, and even omitting it altogether when little vigour is left. But with these precautions he has seen great benefit resulting from the application of cold water.

In cases of St. Vitus's dance he has found no encouragement, for a reason hereafter to be mentioned; but he recommends electricity in this complaint, as one of the few in which this operation seems advantageous.

He promises us little from his remedy in the case of epilepsy, where his experience does not seem indeed to have been extensive. Instead however of his own favourite remedy, he mentions benefit derived, in a case of periodical epilepsy, from a plaster formed chiefly of tobacco, applied near the pit of the stomach before the

expected attack. He has used tobacco also in two desperate cases of convulsion, followed by continued coma, (that is, sleepiness and loss of sense;) but it was in the form of a decoction, applied as a clyster, which he prefers to the fumes of tobacco; the quantity for the decoction being half a drachm of tobacco in four ounces of water. In epilepsy also he applies oxide of zinc (that is the calx of the semi-metal zinc;) and still more efficaciously the *digitalis purpurea*, or purple foxglove, concerning which Dr. Withering and others have lately written largely. The author might have added, that hartshorn or ether mixed with water, and given during the epileptick fit, tend powerfully to shorten it.

But let us close the author's account of his treatment of convulsive diseases, with the following general remarks, extracted from his work. The efficacy of the cold bath in convulsive disorders, is much promoted by its being employed *during the moment of convulsion;* or (as he afterwards chooses to express himself,) its chief benefit depends on its being used in the paroxysm of convulsion; its efficacy consisting in resolving or abating this paroxysm, by which means the return is greatly retarded, if not entirely prevented. This law or principle in the disease, the author tells us, bears analogy to the fact, that madness is best treated in the height of frenzy. He also remarks, that the cold bath seems without effect in every spasmodick disorder, (as St. Vitus's dance,) which does not rise to the height of convulsion. Lastly, he observes, that in cases of madness and convulsion, there must be no considerable wound or other lesion of structure; that the disease should not be too habitual, and especially so as to produce insensibility to impression; that the fit should have a *general influence on the frame;* and that the digestion should not be too much impaired, nor the vigour of the circulation much debilitated, lest the action of the cold be too strong for the living powers.

"Cold water (says our author) cannot be used as a *drink* during the paroxysm of *convulsions;* and of course we cannot show the analogy between its external and internal use in these, as in other diseases.

"That its effects (he adds) taken internally, are most salutary, in a numerous class of *chronick* diseases, is however well known; though perhaps not acknowledged to the full extent of the truth. A considerable part of the virtue of mineral waters is doubtless to be attributed

either to the diluting quality of the pure element itself; or to the invigorating effect of cold on the stomach, and through it, on the system at large. * * * In hypochondriacal, hysterical and dyspeptick* affections, cold water taken internally has produced the most salutary effects. Hoffman praises it in headache, whether arising from indigestion or some primary affection of the nerves of the head. The following case will show the use of cold drink in certain convulsive affections." Here the author cites from Hoffman the case of a Jew boy, cured of violent convulsions in a fortnight, by drinking cold water frequently every day.

Dr. Currie applies the term *tepid*, to water heated from eighty-seven to ninety-seven degrees of Fahrenheit, where it is used for affusion; though water will seem to be warm to the body at some degrees lower, if used as a bath, for in this case the evaporation is excluded. The cold from evaporation is so considerable, that water in the warmest climates will chill the person moistened with it, if standing in a current of air in the shade.

The author finds the coolness remaining from the *warm* affusion (strange as it may be thought) as great, as that from the cold affusion; and perhaps greater; but the cold is less sudden and stimulating. Without inquiring into the author's reasonings, let us observe that he applies the tepid affusion to certain other cases where there is fever; provided the chief view is to diminish the heat, and provided there is no contagion present, nor any foul matter in the bowels, as likewise no local inflammation; for we must never forget that affusion is only recommended where the heat is *general*. Under these impressions, the author employs the warm affusion frequently with children; and he has used it also where the lungs were affected; and especially in his *own* case, during the hectick fit, in hereditary consumption. But independent of the possibility of the respiration being affected, he remarks that in hectick cases, the body soon parts with its heat, which is then seldom great, even in the extremities. He recommends, however, in any event to moisten the inside of the hands and feet; since from the sensation of heat in the extremities, great irritation follows to the system.

* Dyspepsia, in general, includes the obvious diseases arising from indigestion.

Dr. Currie every where insists, that when the patient feels chilly, neither affusions, nor wet sponges, of any kind, are to be applied; but he repeats. that the cold affusion (which he calls an *energetick* remedy) is not only the most effectual, but *safest* application, in many of the cases where it can be used; since the system often accommodates itself to a sudden cold which is general and stimulating, but shrinks from a cold which is slow and successive.

Water tempered from seventy-five to eighty-seven degrees, (which the author terms *cool*) is recommended for febrile diseases; but more frequently for palsy and other cases of debility. If the system is to be strengthened, or if diseased associations (or habits) are to be broken through, the application is to be quick and brief; but if it is merely to allay heat, and there is no danger of indirectly affecting the respiration, it may be used more slowly.

Such are the principal uses of water here to be mentioned from Dr. Currie.—We may be permitted to add one or two to his list. In cases of strains, dislocations, or fractures, *cold water* employed externally has had the happiest effects: operating in the first case like a charm; and in the others, allaying inflammation and preventing swelling, till the arrival of the surgeon, who then finds less impediment in examining the bones. With bruises and burns, similar advantages perhaps may be expected. But in all cases, it must be remembered, that the application must be *immediate* and long continued, and used merely to the part affected; and the water changed whenever the cold goes off.

That the facts respecting the use of *cold water* in certain diseases, as detailed in these sheets, may seem applicable to the case of the inhabitants of the United States, the author of this abridgment has judged it proper to cite the following evidence of some eminent physicians of America, on this subject.

In the "history of the *yellow fever*, as it appeared in the city of New York, in 1795, by Dr. Alexander Hosack, jun. of that city," we are told that "the most certain and successful means [of cure] were, to wash the whole surface of the body with *cold* vinegar and water; and, immediately after, covering the patient with blankets, to administer such medicines as possess the effect of bringing on sweating. Of these, the spiritus mindereri and saline drafts of Riverius succeeded well; more espe-

cially if the warm drinks were continued; such as the infusion of snake-root, gruel, toast water, tamarind water, lemonade, &c. These were much aided by applying to the feet of the patient a warm brick, steeped in vinegar and covered in a flannel cloth wet with vinegar or spirits: the steam, thus emitted and diffused through the bed, had a wonderful effect in softening the skin and exciting sweat; especially where the *cold* washing had been previously employed.

"Some practitioners have preferred the practice of plunging the patient several times in a cold bath, and violently dashing the body with cold water. But simply washing the patient with cloths dipped in *cold* vinegar and water, was found much preferable to immersion;* both because it more effectually diminished the heat of the system, and was less fatiguing to the patient. Experiments have proved, that repeatedly wiping and washing with water, in the ordinary way in which the operation is performed, diminished the heat seven or eight degrees more than simple immersion, or dashing it over the body with pails.

"The practice of cold bathing in fevers of this type, is not a new one, but was very commonly employed at Breslaw in Silesia; and of late years has been very successfully applied in the West Indies,† as well as in different parts of Europe, where diseases of this type prevail.

"Professor Gregory, of Edinburgh, and Dr. Currie, an eminent physician at Liverpool, have also prescribed it with great advantage in the low typhus fevers of those cities. But its great success in the *New York hospital*, as employed by Dr. Samuel Bard, and in the private practice of my *brother*, have fully convinced me of its use.

"It is also proper to remark, that where the physician was not called to the patient in the first stage of the disease, and putrid symptoms had appeared, and the patient had become much debilitated, the cold bath was injurious: and from the abuse of cold bathing, by employing it in the *last* stage of the disease, it has fallen into disrepute with some practitioners. But as the abuse of a thing is no argument against its use, I repeat my observation, that in the *first or inflammatory* stage of the disease, it was one of the most useful remedies that was employed.

* Before deciding here, we must consult Dr. Currie

† See Dr. Jackson on the diseases of Jamaica.

"When the cold bath had been thus made use of, and immediately after followed by the spiritus mindereri or saline mixture, with plentiful dilution, it rarely failed to produce sweating in the course of fifteen minutes; and when once induced, it was easily continued by the repetition of the sudorifick medicines and drinks, until a solution of the fever was obtained. In some instances, where the patient refused his drink and medicines, or from the carelessness of the nurses, they had not been supplied as frequently as was proper, and the perspiration had been suppressed, it became necessary to repeat the cold bathing; which seldom failed to procure a return of the *sweating*. By the continuance of this discharge, an abatement of all the symptoms took place. It appeared to operate as a specifick in the disease; the pulse in a short time became moderate; the heat of the skin diminished; the pain in the head and back, before so distressing, was also relieved; the sickness of stomach and vomiting were removed; and in the course of two or three days from the attack, the patient had little else to contend with but mere debility."

Thus far Dr. A. Hosack, jun. who, as we perceive, cites the authority of his brother Dr. D. Hosack, and of Dr. S. Bard, both of New York, in addition to his own. We must observe, that neither of these gentlemen, at the time of the publication of Dr. A. Hosack's pamphlet, had seen the larger work of Dr. Currie; of which the first edition appeared at the close of 1797, and the second in 1798. This work therefore merits an examination by itself, even by the physicians of New York. One of them, whose name has not yet been mentioned, but whose own productions are read even in the centre of Germany, mentions in a private letter, that Dr. Currie's work did not reach New York till the present year (1799.) He himself says of it, that "it appears to be a judicious and interesting practical work." But not to dwell upon an opinion given incidentally only, however weighty may be the judgment of the party, we proceed to other evidence.

An American physician, whose name is known in every part of the civilized world, states that "he can from the experience of five years, subscribe to all Dr. Currie's remarks upon the use of cold water in the disease which has lately afflicted * * * Philadelphia." He adds, "its efficacy is now admitted by nearly all our physicians.—It is so far from interfering with, that it aids the opera-

tions of bleeding, and mercury. Where cold water has been too feeble to compose the inordinate actions of the blood vessels, I have used *ice* with great advantage. When the head is much afflicted, I confine the ice in a bladder and apply it to the forehead. In a few minutes I have seen it abate pain, remove a delirium, and sometimes induce the most salutary sleep. Its effects are equally obvious when applied to the seats of *violent* disease in other parts of the body; provided none of those circumstances forbid its application which are mentioned by Dr. Currie."

In various eastern countries, we find cold water used as an instrument in medicine; the custom probably being derived to them from ancient times. Dr. Currie not only cites the example of the Chinese, but of others; and he especially refers to the treatment of the sickness of sir John Chardin, in Persia; and Dampier says,* that he himself was cured of a flux, by bathing daily in a river in some of the eastern parts of Asia. But it is not from the rude practice of the orientals, nor even from Hippocrates or Galen, who each employed cold water medicinally, that we are to expect nice distinctions in these cases. Such do not in general offer themselves suddenly even in our own times.

Dr. Wright made his experiment in 1777, and (as every physician ought to do where he has the opportunity) he made it upon himself. He has great merit; but that merit does not consist in having given us *sufficient rules*. In 1788, a part of the practice in question was established in the Liverpool infirmary; whence it spread into the town of Liverpool and its surrounding country. In 1791, Dr. Currie's colleague published an account of these methods in Dr. Duncan's medical commentaries for that year. Dr. Currie himself published another partial account in 1792. Dr. Gregory (the younger) of Edinburgh, has spoken on the subject in his publick lectures; and even in 1737 it was used in a vague manner in Silesia, though it is now probably neglected there. Various practitioners also have resorted to cold water in the West Indies, and some likewise in the United States. But as the practice has not gained ground generally, and chiefly for want of the rules necessary to prevent mistakes, especially in the case of fever, we have sufficient proof of our

* This fact is stated upon memory only.

obligations to Dr. Currie. What thanks would not be due to him, who should teach with certainty when to employ, and when to avoid *blood-letting;* and especially should he give so accurate a guide as a thermometer and the feelings of the patient as to heat, when confirming each other ?*

The thermometer indeed cannot always be used by the country practitioner, to whom we shall soon suggest a substitute ; but to others, who can more easily obtain this useful assistant, we address the following information.

Mr. John Hunter, in the London philosophical transactions for 1778, (see also those for 1779) describes a thermometer of his own invention and of Mr. Ramsden's workmanship ; which was short, slender, and with so small a bulb, that he could upon occasion put the whole into a peacock's quill ; even including the scale, which was moveable† and of transparent ivory, being in the form of a hollow tube, and no where touching the bulb. The results of this thermometer differed from those of others before used by John Hunter, and even from his own expectations. It was this sort of thermometer which Dr. Currie employed with his patients ; taking care to make the stem bend backwards in order to admit of his standing behind the sick, to avoid infection from their breath. Dr. Currie recommends as a farther improvement to add a guage like that used by Mr. Six, in his thermometers made upon the

* This was written before seeing Dr. Rush's late brief and simple rules for blood-letting.

The members of the three learned professions in America, notwithstanding the worth and well known talents of many among them, have long been liable to the reproach, of having contributed little to the progress of their respective sciences, by means of their *publications.* The American practitioners in medicine have lately relieved themselves from this charge, by some valuable works. Among the earliest of these *authors* we must certainly place the amiable and respectable Dr. Rush, who has so eminently contributed to excite an emulation among the medical students in his own state. Professor Mitchell, and others, have most happily introduced a like emulation into the state of New York ; which it is hoped will soon spread itself.

† A moveable scale admits the application of the naked thermometer in certain cases ; and the observer by a mark on its tube, is easily enabled, when the scale is afterwards restored to its place, to ascertain where the mercury has stood during his experiments.

plan of those invented by lord C. Cavendish. (See London Phil. Trans. for 1782 and 1757.) But a thermometer with spirits of wine (which sufficiently corresponds with one of mercury in the high temperatures here in question) would probably be visible enough to answer every purpose, were the spirits, as is usual, *coloured;* and it does not appear, why excessive diminutiveness is so necessary a quality in mere medical thermometers.

We have hinted that country practitioners must often be content, and may do sufficiently well, without thermometers; and especially in these parts of the United States, where thermometers are so seldom found corresponding with each other; and where, even if good, they are with difficulty replaced in case of accidents. The uses of the thermometer in Dr. Currie's system of practice are chiefly two; one to show the heat of the patient, and the other the temperature of the water to be applied to him.

Let us begin with the latter subject. It is known to every practitioner, that boiling water is always of the same heat in the same state of the atmosphere. Next, it will soon be shown, that water can always easily be found at hand at certain other known degrees of temperature. Lastly, rules may be given, for producing *any intermediate temperature* between that of boiling water and of water of any other known temperature, *merely by mixing them in certain proportions and with certain precautions.*

We shall now show that water may generally be found of several temperatures, which are easily ascertained without the aid of thermometers. 1. In winter, water which has remained a certain time filled with ice or pounded snow, after it is poured off, will stand at the freezing point, or at thirty-two degrees of Fahrenheit's thermometer. Water will also stand at the freezing point, when taken from underneath a surface of thick ice, formed upon it in winter in a vessel of moderate size.* 2. The average temperature of the air throughout the year may be known for any place; and this temperature is one and the same with that of the springs of the place when first issuing from the ground, and also of the earth of the place at a few feet below the surface. 3. The average temperature of each month also may easily be known for

* Mr. Nairne, instrument maker at London, first noted this fact, in itself so evident.

any place ; and when known, it will commonly nearly mark the temperature of the water accidentally found in any considerable vessel, placed under shelter from the wind and sun, but exposed to the open air ; especially upon making certain obvious allowances.

Enough then has been said as to the fixed points of heat at which water may be found, and the methods by which it may be tempered by being mixed in different proportions at different temperatures, for the purpose of bathing, aspersing, or moistening the bodies of different patients according to their respective cases. Happily very great nicety is not found to be requisite ; and perhaps the guess of the practitioner will always abundantly suffice. In this case, what has been said on these subjects will not be lost, since it will find its place with those attentive to *meteorology* and other branches of natural philosophy.

As to calculating the patient's heat, without help from a thermometer, in general, we may depend on the patient's feelings, the rapidity of the pulse, the precedence of the cold stage of fever, the colour of the skin, its freedom from perspiration, the fulness of the face, and the marks of *universal* heat to the touch of the observer. That the practitioner may not be misled by the remains of heat which the bed clothes may have kept in the patient from a preceding hot fit ; let the bed clothes be thinned with judgment, and for a short time ; and if the patient still remains hot, he will offer a new criterion as to his temperature. If other rules are wanting, the following are some which present themselves.

Take a short tube of glass, exceedingly thin, and with a very small bore, having one end open and the other closed. Having first heated it gradually by placing its *outside* in heated water, plunge its open mouth into a small quantity of spirits coloured with cochineal, or of aqua-fortis made blue by vitriol or copper ; or if quicksilver is at hand, put it into a little quicksilver. As the air cools in the tube, fluid will rise into it ; and when a very short column (amounting only to a drop or two) has been taken up, we have an instrument suited to our purpose. A cork may be placed in the open end, when this instrument is not in use, to prevent dirt entering, or the evaporation of the spirit or water ; but the cork must be carefully withdrawn, to preserve the connexion with the atmosphere,

when the instrument is employed.* Let the practitioner place it during some time under his arm-pit, when at the sick bed; and, marking the spot then occupied by the column or fluid, let him wipe the instrument, and place it under the arm-pit of his patient. If the patient's heat be *greater* than his own, the air behind the column of fluid confined by the closed end of the tube, will now be most rarefied, and drive the fluid farther out than with himself; if the contrary, the reverse will happen. This instrument must at some one time be compared with the thermometer, merely to show how its scale of variation agrees with that of the thermometer, unless this can be guessed at by other methods. But the degree in which an instrument of this sort will be affected by the changes in the weight of the atmosphere, (for it is a species of barometer) render it necessary that the comparison of it with the heat of a healthy person, should always take place. An object to be farther attended to is, that the patient's heat be not only greater than natural, but at a high pitch even for *fever* heat.

Perhaps chemists may invent some compositions, which by their melting or effervescence may indicate fixed degrees of heat, which may be contrived to serve as standards for the heat of fever.

With respect to the standard heat of the human subject taken *internally* in a *state of health;* it varies with age, constitution, exercise, fulness from meals, and other circumstances, independent of disease. The usual average temperature is perhaps at 97; but eating, for example, increases it one or more degrees. In disease, according to Dr. Currie's observations, it sometimes in extraordinary cases, sinks as low as 92; and sometimes in cases equally extraordinary, it rises to 105. Repeated doses of the *purple foxglove* have reduced the heat to 89, and the pulse to 32 in the minute. Dr. Currie constantly treats the heat under the tongue when the mouth is shut, and the heat under the arm-pit when the body is properly covered, as one and the same; and takes them for his standard of the internal heat. The experiments of John Hunter, Dr. Crawford, and others, upon animals whose bodies have been opened during life, prove that the heat

* Whenever the fluid employed is carried off by evaporation or other accident, it is easy to put in a fresh quantity, in the manner used for putting in the first.

within, near the heart and lungs, is greater than in the other parts of the body. But it is needless to repeat these cruel experiments, which can offer no guide with patients; the stations assigned by Dr. Currie for receiving the instruments to measure the internal heat, answering every purpose in the cases here in view.

Dr. Currie says, in a note, "I intended to have introduced one or two registers of the heat and pulse, taken every half hour, during the paroxysm of intermittent; but this is delayed, till I am enabled to speak from more numerous observations." Dr. Currie, it is to be hoped, will feel himself bound to fulfil this task. If these lines should chance to meet his notice, he is requested by one who respects his benevolent zeal, as well as his abilities, to extend his views; and to favour us with a more accurate account of the internal heat of the human subject in all cases referred to in the preceding paragraph, short of *living* dissections.

To encourage him or others to labours of this kind (which are best pursued in large towns, particularly if possessed, as they are generally, of infirmaries,) we may be allowed to state something concerning the standard rate of the *pulse* in the human subject. The pulse offers an important criterion in fever; and the pulse of persons under given circumstances, when in health, furnishes a necessary point of comparison for the pulse of the *same* class of persons during *disease*. We shall follow in this, the good Dr. William Heberden; observing that he speaks of the pulse as it is found in England.*

Rates of the beats of the pulse in the human subject, during the course of one minute.

During sleep.	On the day of birth,	130 to 140;
	Through the first month,	108 to 140;
	Thence, during the first year,	108 to 120;
	Through the second year,	90 to 100;
Thence to the sixth year, decreasing,		80 to 108;
During the seventh year,		72 and upwards;
Thence to the twelfth year,		70 and upwards.

N. B. The pulse up to this age is more easily quickened by illness than afterwards.

* See medical transactions, published by the college of physicians in London, vol. 2.

Afterwards the pulse is from sixty to eighty; but in men, it sometimes goes to ninety, and in women even beyond ninety. Sometimes the pulse is below forty. It frequently likewise intermits.

After a full meal the pulse increases ten or twelve beats. But if it has ten pulsations beyond the natural rate of the patient's pulse, viewed as varying according to accidental circumstances, it indicates disorder.

In *disorder* during the first year, the rate may pass from one hundred and forty to one hundred and sixty; but want of sleep and appetite, with thirst and the state of the infant's breathing, are here better indications.

Sometimes one hundred and forty-four is a rate fatal at two years; but with others, one hundred and fifty-six and one hundred and fifty-two, are not fatal rates, at the age of four and nine respectively.

With children a reduction of fifteen or twenty beats of the pulse, accompanied with signs of considerable illness, mark an affection of the brain. With adults, a sudden abatement of pulse in fever, and an aggravation of other symptoms, equally indicate disease in this organ.

With adults, one hundred beats denote commonly no evident danger; but danger begins at one hundred and twenty, and unless there be delirium, all beyond is commonly fatal. The author excepts cases of acute rheumatism, and cases previous to a deposit of matter; when there have been recoveries even at one hundred and fifty and one hundred and twenty respectively. He excepts also cases of *low fever* at ninety or one hundred; for here may still be danger.

It is hard to count one hundred and forty beats, unless distinct; but where distinct we may count one hundred and eighty in a minute.

Scirrhous and ulcerous cases, with a hectick, are often for a long time from ninety to one hundred and twenty.

Great pain in certain cases, does not quicken the pulse; as is instanced with gall-stones.

It must not be forgotten in disease, as well as in health, that women sometimes have quicker pulses than men, other things being equal.

Thus far we collect from Dr. Heberden.

A practitioner wishing to pursue observations of this kind, may not always be provided with a watch beating seconds; and, in these parts of the United States, he cannot always be certain of access even to a pendulum clock.

It may therefore be convenient to know, that in these latitudes, a pendulum beating seconds, may be made of a *very fine* thread and a *small* leaden ball; extending in the *whole* about thirty-nine inches and two tenths from the point of suspension; which point we will suppose formed by a very strong dressing pin. Theoretically, a pendulum should be somewhat shorter in these latitudes; but the above total length will answer for practice with a pendulum of the above description. The habits of astronomers show, that it is easy to learn to *count seconds* by memory. The practitioner who is able to do this, may, in certain cases, station one upon whom he can depend, to note the pulsations which have occurred in a patient, while he has been counting apart a certain number of seconds. It can be of no disservice also for a patient to learn the ordinary rates of his own pulse, to tell to his physician in case of disease.

With respect to other indications of the pulse, in which not only certain individuals, but certain nations pretend to a peculiar nicety, we refer to the various authors who have written more or less expressly on the subject.

We do not follow Dr. Currie in his *history* of the theory of fever. We rather give his *own* account of the leading *symptoms of this affection*, when viewed independent of circumstances and under general characters, in order to accompany it with his remarks.

Fever begins with a languor of a *peculiar* kind, seen even in the countenance, and is followed by paleness, cold, and trembling, and (he should have added here) by a shrinking of the surface of the body; the action of the mind and of the whole system being enfeebled. The heart and lungs, being roused by the fluids now crowding inwards, soon press them outwards. A tightness or spasm, however, in the vessels at the surface opposing, the internal re-action becomes increased. If in the struggle, the stomach becomes affected by sympathy, a tendency to sickness ensues. At last, the powers of life prevailing, heat appears, first in one part of the surface, and then in another, but with some fluctuation; till the hot stage becomes universal, when the vessels on the surface finally yield a passage to perspiration, though not always without a check. Such is the course of a single fever fit, when it obtains a regular termination. But in cases of *continued* fever, both the spasm and heat remain longer; till at

length as the patient weakens, the spasm decreases so as to admit of perspiration, and the heat is sometimes brought almost to its natural state; the quickness of the pulse alone persisting, as the *effect of a habit* produced in the course of the disease. Thus he says, when a hot room or bath raises the heat in the human subject four or five degrees, and most of the other symptoms of fever appear; yet after the external heat is removed, and the internal heat becomes natural, the increased pulse still continues; which he attributes to the principle of association, peculiar to life and pervading the vital phenomena, intellectual and corporeal. The author from the same case of artificial heat proves the existence of *spasm;* since perspiration follows this heat so plentifully, as to make it difficult to increase the internal heat beyond one hundred or one hundred and one; whereas at the same temperature in fever, perspiration is often refused. He observes also, that both in hot fever and in the sudden increase of heat in health, the tightness of the vessels at the surface often exists: but when the heat abates, it disappears so as to admit of perspiration; the spasm in the case of health being the result of a resistance to a violent stimulus. This resistance he calls another law of the living system, belonging to every species of vital action, whether of mind or of body.

In these circumstances, he conceives that the general and powerful spur or stimulus of cold water dissolves the spasm or tightness; perspiration and evaporation now succeeding, which naturally tend to reduce the heat and pulse. Whether the cold as a new stimulus *aids* the stimulus already existing in the blood vessels; or whether the cold acts by dispelling or by *counter-balancing* the spasm on the surface; or whether these causes stand more or less combined, will not here be disputed. Certain it is, that the *cold* of the water operates more than its *moisture;* because warm water in general less easily effects a cure, even when producing a greater coolness through its longer application; though it is possessed of those additional chemical powers for dissolving or penetrating substances which are derived from heat. On the other hand, even sudden cold reduces the animal heat, chiefly by affecting the body as consisting of organized living matter. Hence a variation in the effects, both temporary and permanent, of the cold and other affusions, &c. whether we compare

these effects with themselves or with each other, in cases similar in a mere mechanical view.

As to the diminution of *thirst* following the cold affusion on the surface, Dr. Currie by no means admits that much water is ever absorbed by the skin; and therefore attributes this diminution of thirst to the removal of a spasm in the mouth, jaws, and stomach. Whether it be the removal of spasm or something else which is effected within, will not be discussed: it suffices, that *a sympathy obtains between all these parts.* It is no less true, that thirst is allayed by a draught of fluid before it can have entered the circulation; as likewise, that perspiration often as immediately follows.

The author (as has been hinted) attributes the reduction of heat by the tepid affusion, to cold arising from evaporation; but as this stimulus is always slight and necessarily transient, the heat ultimately returns and the effect becomes merely palliative. Even the cold affusion cures at once, only in the early stages of disease; and though uniformly advantageous while the morbid *heat* continues, its effects are less decisive when morbid associations have once been produced.

What then, says Dr.Currie, ought to be the *indications in the cure of fever?* To diminish the cold in the cold stage; to moderate the heat in the hot stage; to resolve the tightness or spasm on the extreme vessels; and, where the inordinate action of the vascular system still continues, to support the powers of life, till the diseased associations die away from the ceasing of their causes. It is also essential, to secure the proper action of the bowels; and, in every case, to unload them of their morbid contents, whether these are the effect or the cause of the disease.

It is a serious errour, according to Dr.Currie, to suppose that febrile poison received into the system, is the principal cause of the *symptoms* of fever; and that these symptoms consist in a struggle of nature to expel the poison. It is safer to consider the poison, as an agent that *excites the system into fever;* the fever being afterwards carried on, not by the agency of this poison, but of the principles which regulate the actions of life. We are not therefore to wait for a restorative process, by which nature is conceived to throw off the poison; but to oppose the fever in every stage with all our skill, and bring it to as speedy a termination as is possible. By the powerful means of

the cold affusion applied in time, the whole of the feverish symptoms vanish. Hence the safety and wisdom of decisive measures before the strength is materially impaired, or diseased habits established.

Those who practise within the *tropicks*, where fever runs its dreadful course with such rapidity, ought especially, he says, to be aware of this truth. They ought also to combat the disease not merely by cold affusions, (which whether supplied by springs or by the sea, can seldom there be below the temperature of 77 or 78 ;) but by actual immersion of the patient in a bath, or in the sea, supposing this at hand. The duration of the immersion he thinks must be governed by the pulse, by the sensations of the patient, and by the thermometer. He refers for the success of this practice to the case of sir John Chardin; and to that of persons, who in the delirium of fever, and chiefly in warm climates, have plunged into the sea, and who in every instance within his knowledge (where they have been saved from drowning) have recovered.* To increase the cold of water in hot climates, he refers to the well known artificial modes of cooling water. He also hints at the practice of alternately plunging the patient in water, and then raising him into the air, where the wind blows over his naked body, farther to cool it; but he says that the utmost care is necessary to guard against fatigue; and we venture to add, that it will be prudent to have means at hand to remove both chilliness and faintness, should either occur. In the northern and middle latitudes of the United States, the effects of cold winters upon springs, furnishes cold water at all times; and ice-houses admit of rendering it still colder.

In hot climates, to cold water for the surface, the author would add cold *drink* in large quantities, where the patient's heat will bear it, especially the heat within at the stomach; and he considers a tendency to vomit as no objection. He confirms his opinion by the practice of the ancients, by the treatment used in the Hungarian fever, (which he holds as resembling the yellow fever,) and by the recommendations of Hoffman in bilious vomitings and dysentery.

We now proceed to glean a few other *detached particulars* from the author's work, which are either theoreti-

* See a remarkable case of this kind in the London Phil. Trans. for 1786, p. 190.

cal or conjectural ; or have no immediate relation to the use of water ; or have not before been sufficiently noticed.

The author wishes both cold water and cold drink to be tried in the case of the *plague*, should the heat in that disease be considerable ; but if it is no greater than in the confluent small pox, which is little, if at all above the natural standard, he has little hope.

The best explanation which he can give of the success of his favourite remedy, in *convulsive diseases and in insanity*, if applied at the moment of their *height*, is taken from John Hunter and Dr. Darwin ; namely, that no *two* great actions seem to take place in the human constitution at the same time ; and that if the balance of vital energy can be turned in favour of a shock from cold, it will supersede the disposition to the diseases in question at their critical moments, and thus break through their associations. Tobacco, used in the *crisis* of epilepsy, is another instance with him of the benefit of employing, in these cases, the balance of power in one stimulus over that in another. From both these remedies thus respectively applied, the good effect he says, has repeatedly been *permanent*.

In *cooling the surrounding air*, or in any other application of cold, in fever, care must be taken to watch the limits within which it is grateful to the sensations ; in which case the author's experience has *uniformly* shown it to be advantageous.

It is believed that the author somewhere speaks of a wet blanket having been used with success. Dr. Crawford certainly gave temporary relief even from delirium, to a patient in fever, by this means ; and nothing but its being used too late, seemed to have made it a palliative rather than an effectual remedy.

The author says, that the action of cold may be conveyed over the whole system by its application to a single part ; as when cold substances are applied to some single part, to *stop bleedings*. Hence, for bleeding from the lungs, he has dipped the feet in cold water ; though he thinks that it might perhaps have been better to have applied cold permanently to the scrotum, &c. ; and he has often here found it safe and efficacious to plunge the patient into cold water up to the hips. In all these instances, the application of cold must be both powerful and permanent.

The same rule as to permanency and degree, is necessary for cold applied *locally* to parts which are *inflamed*. Thus even ice, snow, and the clay-cap, are successfully employed, not only for reducing, but *preventing* inflammation; the sensation of cold in the parts acted upon, speedily subsiding.

He does not apply cold to local inflammation, *if attended with fever;* chiefly, because in such cases there is too great a sensibility to cold and indeed to other stimulants; but this is a subject which he avoids treating at length.

He extends this objection however to *measles*, *catarrhs*, (or colds,) &c. and he is not persuaded that cold can be useful in *pleurisy or peripneumony*. Yet in inflammations of the *brain*, *stomach*, *intestines*, &c. and especially if desperate, he thinks the cold bath should be hazarded. But *in all inflammatory cases*, he inclines to judge it proper to moderate the cold, if employed. Besides sinking for example, gradually, into the cold bath; the state of the pulse and of the heat is to be examined; though the author remarks from his own case, while in health, that the heat within the trunk of the body is wonderfully sustained in the cold bath, notwithstanding it is speedily and permanently lessened at the extremities.

The *house of recovery*, instituted in May, 1796, at Manchester, in England, affords a singular instance of success in preventing infection throughout a large town; and merits a short abstract from our author. Into this asylum on the first notice of fever, the patient is removed; and proper methods (being in part chemical) are taken to purify his habitation. The prevalence of fever has hence diminished to a degree beyond all rational expectation; and the fears that the institution might spread contagion in its particular neighbourhood, are found groundless; since not one case of fever appears there for ten or fifteen cases which prevailed there before. About one in nine only of those admitted, die; and as the result has made considerable impression, it will still farther greatly reduce both the deaths and the danger of contagion, should the poor apply in the *early* stages of the disease. The importance of such an institution, in great towns, may be known from two other facts related by Dr. Currie: First, the apartments for fever-cases, in the Liverpool work-house, are in the very centre of the building, and cannot be entered except through the common stair-

case; and yet not a single instance is known of contagion spreading thence, to the other patients in the house. Secondly, the number of fever-cases annually presented to the medical attendants at the dispensary at Liverpool (a town with a population resembling that of Philadelphia) is above *three thousand;* and the average duration of the fever is about fourteen days, besides fourteen days consumed in the recovery, where the recovery happens. The fever-cases, in short, make nearly one fourth of the whole number of maladies; the loss to the publick occasioned by which may easily be conceived. In Liverpool (and this is another remarkable fact) eighteen hundred cellars are inhabited by about seven thousand persons, besides nine thousand who live in close and confined houses; and many of these persons taste no animal food; tea being generally drank, once, if not twice in the day; from which causes principally, and the use of spirits, above five hundred patients, who are chiefly females, are annually found among those applying to the dispensary on account of *diseased digestion.*

When our author, however, in speaking of the above institutions, affirms with Dr. William Heberden, that cold winters are unhealthy in England; and states that the most unhealthy moment is that when they are exchanged for warmer weather; an inhabitant of these northern parts of the United States cannot but indulge a smile. Perhaps in no part of the civilized western world, is the entire severity of a cold winter *actually* more fully braved, than in these parts; nor can a more sudden transition from heat to cold easily offer; and yet *in no one country in the known world,* is there less disease, or fewer deaths, upon a given number of inhabitants. This fact, and especially in a comparative view, merits a particular attention, which will perhaps be given to it on a future occasion.

The common treatment of fever by the gentlemen belonging to the Liverpool dispensary (which is distinct from the infirmary) consists in giving first, antimonial emeticks; and then, bark, opium, and wine; nourishing food being occasionally administered; but seldom washing with cold water (which would indeed be difficult in the cellars where this disease is usually found.)

Dr. Currie will now offer some more particular and interesting information on the use of opium and strong liquors in fever.

Dr. Currie treats of *opium*, pursuant to the engagement in the title to his work; viewing it as administered in health and in fever.

In a state of *health*, if the mind is vacant, and external objects excluded, and provided also that the stomach is empty, opium usually procures sleep. This sleep is preceded by agreeable sensations, happy slumbers, and gentle perspiration; the surface and extremities of the body acquiring the same heat with the internal parts. As the full sleep approaches, the pulse quickens, and the breath becomes slightly irregular; but when profound sleep has actually arrived, the pulse abates to its slowest rate; while the breathing, besides growing slow, becomes regular also, and deep.

In *fever*, if the heat reaches or exceeds one hundred degrees of the thermometer, with a dry skin; opium *commonly* seems to add to the heat and restlessness. When the skin has softened, and the heat, though still great, is yet subsiding, opium often accelerates the perspiration; and by this means diminishes the heat; in which case tranquillity and sleep generally follow.

Hence, in the case of *continued* fever, which is commonly greatest in the evening, and is then accompanied with two or more additional degrees of heat, an opiate (or anodyne) may injure at night, and yet do service at two or three o'clock in the morning. Hence also in continued fever, it may be proper to lower the temperature of the surface and prepare for perspiration, by cold or tepid affusion or drink, (applied according to rules) before giving, or even after giving, the opium. In *intermittents*, on the other hand, where the disposition to perspire is more easily excited, opium may be given with fewer precautions; though if administered in the hot stage, its salutary effects may be much promoted by moderate draughts of liquids; which should be cold, if the heat is great.

The author conceives water to be a better assistant to opium in procuring perspiration, than ipecacuan or antimonials; except in inflammatory diseases and in dysentery. His dose of opium is two or three grains of the extract, or from ten to sixty drops of the tincture; for he finds that a very small quantity judiciously applied, will produce considerable effects; and he thinks that whatever is beyond necessity, it would be unwise to employ.

Alcohol is another of the topicks standing in the title to Dr. Currie's work; by which term he does not mean,

with common chemists, spirits of wine; but vinous and spirituous drinks. Alcohol (or strong drink) he says, is more heating than opium, and has less tendency to produce perspiration and sleep; but yet has a striking resemblance to opium in its effects.

In *health*, like opium, if the mind is vacant, and external objects excluded, and the stomach empty, strong drink inclines to sleep. But as sleep approaches, the heat of the body rising throughout and the pulse quickening, an agitation follows, which is often opposed to sleep. If the dose however has for the moment stupified all sense, still on the first return of sense, the drunkard is roused from his apoplectick slumbers by intolerable heat; amounting in one case (that of Dr. Alexander, who tried the experiment on himself) to one hundred and seven degrees; and this is accompanied with thirst, agitation, and consequent weakness, as also with obstructed perspiration. The author here, as perhaps in all other cases, where there is heat and a dry skin *without* local inflammation, would prescribe large draughts of water, or the affusion; which is likely to prove more effectual, if cold, than if warm. Opium, where the skin softens, favours perspiration in the drunkard; and sometimes, and perhaps by this very means, affords remarkable relief.

In *fever*, strong drinks must be given with the same precautions, as opium; that is, be avoided in cases of great heat and a dry skin; and reserved for those cases, where the heat is only a little above the natural standard; unless perspiration is certain, when they may be used in a heat somewhat beyond the natural.

Such are the author's remarks on opium and strong drinks. They are offered only with a view to fever; and he so little considers them as complete, that he proposes to resume the subject.

In the author's title page stands another topick yet unnoticed by us; namely *inanition*, or abstinence; and along with it, he handles another important, as well as long disputed point; namely, whether fluids, and consequently nourishment if wanted, can *pass through the skin*.

A part of his conclusions on the subject of inanition or starving, are drawn from a case where a scirrhous tumour took away the power of swallowing. The heat and in general the pulse were natural to the last; the spirits even; the intellect good; the strength sufficient for walking about

the house; neither hunger nor thirst on the whole troublesome; but after a certain number of weeks, a distortion of vision was followed by delirium and other symptoms, which closed the scene. Nourishing clysters gradually increased, in which liquid laudanum was largely mixed, especially in the evening, together with a warm bath of water and of milk, were the only applications. Another patient whose power of swallowing was destroyed by a different disease, used the clysters, but omitted the bath; and never complained of hunger, nor always, nor very much of thirst; his pulse being good, unless previous to death, which in him was easy and accompanied with the perfect use of all the faculties.

Hence the author remarks as follows; 1. A regular pulse is no certain indication of the system being in order. 2. Vital heat is not principally owing to digestion; the increase of heat after food appearing to arise from the influence of the stomach on *other* parts. 3. As the first patient did not easily recruit his heat, when heat was taken from him, the power of doing this is to be held in proportion to the force of the living principle; (and this is a fact which might before have been inferred from the experiments of John Hunter in the papers already cited, in the case both of vegetables and animals; which Dr. Currie at the moment seems to have forgotten.)

We come now to some particularities respecting the *passage through the skin*, to which the first case leads us. The patient in a balance sensible to the amount of a drachm, was found to have had *no difference produced in his weight by using the warm bath*, in three instances where the trial was made. According to the rate at which his body wasted from day to day, during many days, he ought to have lost five-sixths of an ounce during the time he spent in the bath: but he appeared neither to have lost nor gained. He seemed indeed to perspire; but the author conceives the appearance to have been owing to the vapour of the bath resting on his forehead. At the heat of eighty-two in the publick baths at Buxton, in England, the author (with various others) has found no change of weight: in other experiments he has found no change in himself in baths variously heated between the temperatures of eighty-seven and ninety-five; and in several cases of the diabetes, (where indeed a disease in the skin according to him usually occurs) the warm bath has produced no change of weight.

These experiments do not countenance the common supposition, that in case of a deficiency of liquids at sea, thirst may be prevented by wet penetrating *inwards* through the skin. The author is indeed aware of several conjectures to be urged in favour of this supposition ; as for example that what is taken inwards may not show itself in the weighing machine, from being counterbalanced by what escapes outwards ; and that fluid may be taken inwards at lower temperatures than those of the warm bath. But he inclines to overlook these conjectures ; and he likewise dissents from the experiments of Dr. Falconer and Mr. Abernethy, as made only on a part of the human body at once.

He is strongly inclined to think, that though certain vessels* in the skin afford a passage *outwards ;* yet that the absorbent vessels lie below the skin, and never take up any thing from *without ;* unless in consequence of mechanical pressure, or of a wound or a disease in the skin, or of the destructive nature of the matter applied to it. He explains therefore the benefit derived in certain cases from wetness at sea, either to the coolness produced ; or to its preventing the wasting effects which would attend evaporation, could the air have access. The removal of the thirst, he attributes to a relaxation of those vessels in the skin which pass outwards, having effect on the vessels of the stomach by sympathy ; just as perspiration in fever abates the thirst, without the aid of drinking.

But some experiments made in France, by M. Seguin, the coadjutor of the celebrated Lavoisier, which are related by M. Fourcroy, prove the necessity of a new examination of the whole subject. In low temperatures, as from about 54° to 59° of Fahrenheit, the loss of weight in the human body, says M. Seguin, is much greater when the body is exposed in air, than when it is exposed in water ; because, according to him the *air* in the latter case,

* He conceives, with Dr. G. Fordyce and Mr. Cruikshanks, of London, that the matter of the perspiration is separated from the blood by the capillary arteries, and then thrown out by organick pores existing in the cuticle (however difficult to be discovered) which are connected with the extremities of these arteries ; and he supposes that in this process, there is not a separation merely, but a new combination ; during which a loss of heat may take place, accounting for a part of the coolness attending sweating.

cannot, pursuant to its office, dissolve the perspirable matter on the skin; so that a loss of weight can now only arise from what escapes through the lungs. At about 70°, the disproportion of loss somewhat increases; as the air entering the lungs, from having been previously loaded with the moisture of the bath, does not so rapidly dissolve the perspirable matter in the lungs. At 90° and upwards, by the increased action of the heart and arteries, sweat flows from the skin, and lessens the above disproportion; which, from being about three to one in favour of the air, becomes now only as about two to one. But in no circumstances, does M. Seguin find any absolute increase of weight in the bath.

To decide however more precisely whether absorption through the skin occurred in water, M. Seguin dissolved in water a preparation of mercury, in which different venereal patients bathed their feet, and apparently without taking any of the mercury into circulation; unless where the skin was broken, as in the itch, &c. At last he directed his experiments upon himself, as a person in health; bathing a part of his arm in water containing a preparation of mercury; and covering the glass which held it, as also his whole body, his *mouth* excepted, with gummed or with waxed silk according to the case. In low temperatures, he found no effect. At about 72° of Fahrenheit, mercury was taken into the body, but no water; whence he concludes, that the lymphatick vessels did not perform this absorption, since they would more readily have imbibed the water. When the heat of the bath was pushed on nearly to blood heat, even mercury was no longer taken up. Hence the author supposes that the mercury, when the water was at 72°, penetrated into the drops of sweat slowly moving outwards and thence into the body; which could not happen, when the drops of sweat rolled out faster in greater heats.

When other substances act through the skin, M. Seguin in effect explains the case nearly as Dr. Currie. He decides also from these experiments, that contagion acts through the air and lungs, and not through the skin by contact; that the diabetes arises from water left in the lungs; and that dropsies occur from the absorbing being stronger than the exhaling vessels, (the absorbing being supposed to operate only on what is *within* the body, including what is found in the lungs.) Some of his other conclusions do not seem to regard our purposes.

Upon a *comparison*, it will appear, that in Dr. Currie's experiments, no weight was lost in the warm bath, at least that was discoverable by his weighing machine; but that in those by M. Seguin, weight was actually lost in the bath, though less than was lost under the same circumstances in the air. Surely these matters require elucidation, and happily they may be pursued by any person in any country. Indeed our inquiries demand to be extended to many other objects still more familiar. So simple a fact as the state of heat in starving persons, (supposing the cause of the ambiguity not to be in the nourishing clysters) is still the subject of dispute; and the same as to the heat in the diabetes. And Dr. Currie has perpetually to complain, that the heat is little observed in any disease whatever.

Whoever inquires experimentally into the comparative weights of the body and of the powers of the skin, will of course seek to consult Sanctorius and other celebrated authors; but let him not overlook the English Dr. Stark, of whose experiments Dr. Franklin was so fond. Dr. Stark, like many others in Europe, exposed his life in medical researches, and would himself have been more celebrated, had not his zeal brought upon him a premature death. Lieutenant (now Admiral) Bligh has given a relation of a famine at sea suffered by himself and his companions, which deserves particular consultation; for he was left adrift in a boat in the Pacifick ocean, during six weeks; in consequence of a mutiny on board his vessel, which was conveying the bread-fruit, spice, and other plants, to the British West Indies. Nor will Dr. Franklin's remark be useless, as to the *loose texture of the skin*, after having long remained immersed in water.

The practice of *anointing* the skin among some of the ancients who were *fully* clothed, and among many nations ancient and modern using *little* clothing; also calls for attention. Unction with them seems a custom alike prevailing in warm and cold weather. If new principles are called for to explain these usages, modern lights and modern accuracy will probably lead to them.

Dr. Currie connects the *warm bath* with the subject of *unguents*. He says, that the warm bath is used in the French, and is beginning to be used in the English West Indies; and he supposes it salutary after exercise; and that it restrains profuse sweating, keeps up the heat of the surface and extremities so as to prevent re-action in

the arterial system, and sooths the sensations; but he adds, that on leaving the bath, friction should follow, with the anointing of the surface to prevent evaporation. To this system, however, he would join flannel clothing next to the skin, after the Greek and Roman manner. Perhaps these things should accompany each other; but without going so far, it is clear that cotton would be useful next to the skin both in hot and in cold countries; pursuant to the boast of the English cotton manufacturer, who says that whoever uses cotton *once*, never quits it. The use of oil is also proper for swimmers; and among other reasons (as Dr. Currie remarks) that the body may glide more easily through the water, as well as to guard them (as we have added) against the cramp.

Dr. Currie thinks that the perspirable matter of Europeans is not well fitted for the torrid zone, as being too liquid; adding that the sweat of the negro is unctuous or oily. Has he or others made the comparison in a scientifick view; and taken the case of the Hindoo and other Asiaticks, with that of the original Americans, into the account? The question demands to be treated with caution.

Dr. Currie, in a paper in the *Appendix* to his work, speaks of a *ship-wreck of some Americans near Liverpool;* adding remarks on the influence of fresh and salt water, hot and cold, on the powers of the living body immersed in it: the article being extracted from the London Phil. Trans. for 1792.

It appears as to the Americans, that two who died early during the accident, suffered from an alternate exposure to air and to water (both salt and fresh;) that others survived, who were more plunged in the sea, one excepted, who was desponding, but who died later; and that he who suffered least, was a black, who was covered to the shoulders in the sea. The sea was about thirty-five degrees in its temperature, according to the author's present conjecture. The air was probably still lower, and attended during part of the time with sleet and snow and a piercing wind. The stay on the wreck on the whole was twenty-three hours. The two who died first, were delirious; none were ever drowsy; but all were thirsty and hungry. Mr. Amyat who related the story, had his hands and feet swelled and numb, but not senseless; his mouth parched; a tightness at the pit of the stomach; and distressing cramps

in his sides and hips. Hence we may perceive the advantage of having been continually covered with the salt water.

This accident led the author into a train of experiments on what he esteemed the most fundamental power attending life; namely, the capacity of the body *to preserve the same heat under different circumstances.*

In his first experiment, a young man, who was plunged into a bath at 44° of Fahrenheit, had the thermometer under his tongue reduced from 98° to 87°; then raised gradually in twelve minutes to above 93°; but upon being exposed to the wind at 44°, though attendants were rubbing him, it fell again in two minutes to 87°; nor did he, though every resource was employed, entirely recover his heat under three hours. A second experiment on the next day, gave nearly the same result; as did a third on the following day; but in the third, the man was afterwards plunged into a *warm* bath on being taken out of the cold air, when the thermometer *sunk* two degrees. But the thermometer rose again more quickly than in the cold bath, and the heat was general over the body, and not confined (as in the cold bath) to the trunk alone. In a fourth experiment on another day, a longer stay in the bath produced inconveniences somewhat resembling those felt by Mr. Amyat; and great pain followed afterwards from a warm bath at 104°,* into which the party was too suddenly transferred. Three other experiments offer little essential variation, though two of them were tried on a new subject.

The cold water had always salt mixed in it, in the proportion of one to twenty-four; and the cold was always lessened one or more degrees by the stay made in it.

The parties immersed were generally agitated, so that the pulse was quickened; but the cold bath sunk it twenty beats in the minute from its last rate; and at the wrist, it was scarcely to be felt. A sense of cold at the stomach

* In cases of this sort, "Heat (says John Hunter) must be gradually applied, and proportioned to the living principle; but as the life increases, we may increase the degree of heat." See his proposals for recovering persons apparently drowned, in the London Phil. Trans. for 1776. Mortification arising from heat too suddenly applied to a frost-bitten limb, is one of the facts, on which he founds his opinion.

was generally followed by a rapid fall of the thermometer; and heat applied there so generally restored the heat in other parts, that the author is persuaded that the stomach or diaphragm, or both, have some concern in the process of animal heat.

The following facts also appeared. 1. The parties best resisted situations tending to produce cold, when they possessed most of their natural heat, as by wearing a flannel dress. 2. Cold wind operated more severely than colder calm weather. 6. Though the human body rapidly accommodates itself to change, yet the change may be made too quick, especially when the strength is diminished. 4. The action of cold water is more or less considerable, according to the vigour of the constitution. 5. The condition of the mind operates also; fear increasing the influence of cold; and attention pointed to other objects, as in madness, diminishing it. 6. These experiments require great caution, and the presence of every means necessary for counteracting their effects when carried too far.

The author, in an experiment upon himself, passed alternately but gradually out of a cold into a hot bath, twice; staying a short time only in each bath, and being covered with a flannel dress; but his internal heat never varied from 96.

By another experiment, it was found, that the cold of *fresh* water is more difficult to support, than that of salt water.

In another paper of the Appendix, we find *Dr. Wright* again coming into notice, through Dr. Duncan's Medical Annals for 1797. He was still, among other things, using, in the West Indies, external applications of cold in various shapes in the early stages of the ship fever and of the yellow fever, and with continued success; and in the latter stages, he employed calomel in small doses, to procure purging and *sweating*. Where the stomach was too irritable for calomel, recourse was had to Capsicum (or Cayenne, commonly called Kian, pepper) made into pills; and it has cured even after the black vomit. This pepper has been given in the putrid sore throat, in the West Indies, with the most signal benefit.

In the course of this paper concerning Dr. Wright, Dr. Currie observes that perspiration seems useful in *every fever in every country*, not excepting the famous

English sweating sickness; but that for this purpose it must be *profuse*, and also *early*, since in the latter stages of fever it is often injurious. The mode of exciting it, he says, may however be mechanical. Mr. Thomas Graham, for example, covers the whole surface of the body for this purpose with warm vapour, in the early stages. In the plague, count Berchtold relates, that perspiration may be produced by a pint of olive oil, rubbed during four minutes, upon the patient in a close room over hot coals, with a clean sponge; or if the first trial fails, then after wiping the body with a warm dry cloth, it may be repeated, and be aided by sudorifick drinks. But in every case, the sweating must not only be early, but may be employed during the cold fit; when it will still leave room for the use of cold water in the hot fit, should the hot fit still occur.

Before quitting Dr. Currie, we shall give him pleasure, by affording him an opportunity to rectify two or three oversights.

First, Dr. Cullen does not, as he intimates, neglect *cold* as a cause of fever.

Next, Dr. Currie attributes the discovery concerning the near agreement of the heat of springs with the average heat of the place where they are found, to Dr. John Hunter, a British physician of eminence, (but not related to the celebrated surgeon and anatomist of that name.) Dr. Hunter's reputation does not need the aid of borrowed fame. The first observer of the fact appears to have been Dr. John Roebuck, F.R.S. at least Dr. William Heberden's comment upon the subject implies it. (See London Phil. Trans. for 1795.)

Lastly, Dr. Currie seems also to have omitted to notice Dr. Crawford's paper in the London Phil. Trans. for 1781; where that amiable philosopher stated, that the *difference* between the colour of the venous and arterial blood increases with *cold*, and lessens with *heat;* and that from the event connected with this difference, nature finds the means of proportioning the generation of heat to the call for it.* Dr. Currie knows that this difference of

* Is there any decisive difference in the colour of the venous and arterial blood in insane persons indicative of their known power to resist cold, which the practitioner can pursue through all its mazes, so as to arrive at the means of assisting their malady? Their power of resisting cold has indeed its limits, since

colour had its proper cause* assigned to it, by Dr. Priestley; which paved the way for Dr. Crawford's application of the fact, to explain the origin of animal heat as coming from the action of the air on the blood in the lungs. The above additional fact, noticed by Dr. Crawford, if confirmed by a few more experiments, will probably go far to remove Dr. Currie's difficulties concerning this beautiful discovery respecting animal heat, which he extended also to combustion. Mr. Cavendish and the French chemists have by their new system led to some modification of this discovery, (for it is no longer to be called theory;) but however this shall be decided by time, the essence of the whole is Dr. Crawford's, and will render his name immortal. Dr. Rutherford, of Edinburgh, under their modification, explains the supply of water in diabetes to arise from "a portion of the oxygen, (which in the ordinary course of things is exhaled in the form of an elastick vapour,) being absorbed in the form of water." But Dr. Crawford's discovery requiring to be treated at length, we for the present drop any further discussion of it; especially as this hypothesis regarding diabetes, leaves its *symptoms* still unexplained.

In taking leave of Dr. Currie, let us do justice to his ingenuity, industry and candour. If his work stands the test of time, immortality also will be *his* lot. He is well known to many Americans frequenting Liverpool; but it is not perhaps known to all Americans, that besides Middlesex, no county in England can boast of so many able and spirited medical men, as that of Lancaster; especially if we include Dr. Haygarth in the number, as united with them by intercourse, though residing in Chester. Among the foremost of these, we may certainly place the excellent Dr. Percival, of Manchester; to whose zeal for philosophy and for humanity, we may attribute, in no small degree, the honourable pre-eminence here mentioned.

their limbs may be frost-bitten; and perhaps it seems greater than it is, from their attention (where they can command any) being directed to other objects; in which they agree also with children.

* Mr. Hewson and others had been aware that the air operated here, but they knew not *how* it operated. See London Phil. Trans. for 1776.

As to our analysis, though it includes the chief substance of Dr. Currie's book containing 347 octavo pages, the reader will not fail to peruse that work, with pleasure; nor, having read that work, will the reader perhaps regret his having seen this analysis. Dr. Currie is not in every respect methodical; but he is more; he is original on some of the most important of medical subjects.

The foregoing abridgment was published in a pamphlet, during the melancholy devastation of our cities by the prevailing epidemick fever. The respected and benevolent author will not, it is presumed, require an apology for the republication of a work so honorary to himself, and so extensively useful to the community.

A BRIEF ANALYSIS

OF THE SECOND VOLUME OF CURRIE'S MEDICAL REPORTS.

THIS volume is composed chiefly of additional evidence in favour of the opinions and practice proposed in the volume preceding. This evidence is furnished not only from Dr. Currie's own experience, but is communicated to him from practitioners in various situations, and from various climates.

The following is a comprehensive statement by Dr. Currie of his experience at the time of publishing this volume.

"In the six years, which have elapsed since the publication of the second edition of the first volume, I have invariably employed the affusion of water, cold and tepid, in the diseases pointed out in the original publication, and I have extended it to some others, of which I shall afterwards speak. Its success has equalled my expectations; I have nothing to detract from the accounts I have formerly given of its efficacy. I repeat, that used in the three first days of fever, the cold affusion very generally stops the disease—that the same happy effects sometimes follow its use on the fourth or even fifth day, but seldom later; that even in the subsequent stages, where the heat

continues preternaturally great, and the skin dry, it is of great and manifest advantage, almost immediately relieving the most distressing symptoms, particularly restlessness and delirium, and conducting the disease to a safe and speedier issue.

"The tepid affusion is, as I formerly observed, applicable, and possesses very considerable, though inferiour efficacy. I find it, however, very safe, easy of application, and in a high degree grateful, and I have extended it to almost the whole class of febrile diseases. In my practice the cold and tepid affusions are very often combined in the same disease. While the heat is great, the skin dry, and the vascular action strong, I use water perfectly cold; when these symptoms diminish, I use it cool; and as they subside still farther, I make it tepid."

The precise meaning of these terms is given in chapter X. Vol. I.

The limits of this analysis will permit us to state only such remarks as are most essential, and those in very general terms.

Dr. Currie describes an epidemick dysentery, which prevailed in Liverpool, in 1801. In this disease, which was attended with fever, he did not try the application of cold in any form; for he had learnt by experience that that remedy was not successful in fever, attended with affections of the bowels. The tepid affusion he did try, but without any permanent benefit, although it abated the heat.

In scarlatina of the same year he employed very extensively "the affusion, both cold and tepid, with the happiest effects." In this disease he followed the same rules, as in fever, without any regard to the eruption. Both Dr. Currie, and Dr. Gregory, professor of the practice of medicine in the university of Edinburgh, evidenced their confidence in the cold affusion by applying it to their own children, when affected with scarlatina.

In this disease it is commonly necessary to repeat the affusion very often, and at very short intervals; in some instances ten or twelve times in twenty-four hours. Dr. Currie assisted this remedy by giving cold drinks, and by opening the bowels, if necessary, with sub-muriate of quicksilver; and in a few cases he also employed tartrite of antimony as a diaphoretick. He suggests doubts respecting cinchona in this disease; and strongly repro-

bates the use of wine, while there is any considerable heat on the surface.

In typhus, which also prevailed in Liverpool, in 1801, our author did not find his favourite remedy so useful as on former occasions. The affusion, seldom lower than cool, generally tepid, was employed in most cases of the fever of that season. It was beneficial, but did not cut short the disease, even when employed at an early stage. But there was an unusual deficiency of heat, and therefore no opportunity was afforded of employing the cold affusion, which is much more efficacious than the tepid water. Dr. Currie suggests, in contradiction however to his own principles and cautions, that "a practice somewhat bolder might have been more successful."

Dr. Currie avers, that he has not seen nor heard of any instance, in which the practice of cold affusion has been injurious. He doubts the utility of this practice in cases where there is an unusual sensibility of the surface of the body to cold. Yet he gives a case, in which Mr. Dalrymple, of Norwich, disregarded this doubt not only with impunity, but with advantage.

In some cases of *cynanche tonsillaris*, or inflammatory sore throat, and likewise of measles, the cold affusion was employed in the earlier stages under a mistake respecting the nature of the cases. In these instances, there was no injury produced; and they were noticed as proving singularly mild.

Dr. C. did not employ the affusion of water on any person affected with influenza, except himself. While he had that disease he submitted to the shower bath at 85° every three or four hours. The effects seem to have been beneficial. But Dr. Wright informed him that he employed the cold affusion in this disease to "keep down heat and flushings," at the same time he allowed wine and a liberal diet; "a mode of treatment, which he found invariably successful."

The following statement is quoted, as it relates to cases of yellow fever, originating in our own country.

"Mr. Wilson, surgeon of his majesty's ship the Hussar, employed the cold affusion with extraordinary success in 1795. The Hussar had taken a French ship from Guadaloupe, off the capes of Virginia, which had brought the yellow fever out of port with her, of which many had died. The disease spread rapidly among the crew of the Hussar, and the ship, running northwards, landed eighty-

three persons ill of the fever, at Halifax, in Nova Scotia, in the month of June. There not being accommodation for them in the hospital, tents were fitted up for them on the shore, in which Mr. Wilson attended them. His practice was to bleed early, generally in an hour after the accession of the hot stage. He then gave a solution of emetick tartar. The cold affusion was always administered in cases of delirium, which it immediately removed, inducing tranquillity and sleep. *Of these eighty-three cases, Mr. Wilson did not lose one.*"

Among many very important communications and testimonials in favour of the practice of cold affusion, is an interesting letter from Mr. Nagle, surgeon to his majesty's ship Ganges, to Dr. Currie; but its length forbids its insertion here, nor does the subject require a more ample illustration.

Although not precisely connected with the subject, we cannot omit to notice one very interesting case, in which an ounce of tincture of opium was swallowed by mistake. After vomiting, the other usual effects were following, but these were almost completely counteracted by the repeated affusion of water heated to 106° and 108°, over the naked body.

It does not belong to this place to decide either on the merit or on the precise extent of the utility of the practice recommended by Dr. Currie. We must, however, exhort every man who practises physick, to study the work, of which this is a very short analysis, and in adopting its principles to regard all the rules and cautions it inculcates.

The treatment of malignant or typhus fever by the affusion or ablution of cold water has been adopted since Dr. Currie's publication, by some of the most eminent physicians on both sides of the Atlantick. Dr. Thomas, author of modern practice, a work of superiour merit, asserts as an indisputable fact, established upon the firmest basis, that affusing the body with cold water is one of the most powerful and efficacious means which we can employ in typhus fever. But its effects will be more salutary in proportion as it is adopted early, or during the first stage of the disease, and it ought always to be employed immediately after having evacuated the contents of the alimentary canal. He refers to an ingenious publication on the subject, by Dr. Jackson. (Exposition on the practice of applying cold in fevers.) Both these physicians having

resided in the West Indies, experienced extensive opportunities of putting in practice this remedy in the malignant fevers of that climate, and they adduce the most substantial evidence of the success which attended the practice both in their own hands and in those of many other respectable practitioners.

Among other testimonials of successful results, the author mentions that Mr. Marshall, surgeon of the Cheshire regiment, employed it at an early period, in sixty-four cases, in sixty of which the disease was happily arrested by having recourse to it three or four times, and in the other four which were advanced in their progress, although the disease was not prevented from going through its natural course, still all the patients recovered. Mr. Marshall mentions, that from the time he began the cold affusion he used little or no wine, no opium, nor indeed scarcely any other remedy in any one case in which the cold affusion was employed; which report Dr. T. thinks, is of itself sufficient to establish its decisive superiority over every other mode of treatment. Dr. T. always takes the precaution of giving a glass of warm wine, or some other powerful cordial, immediately after employing the remedy. He relates numerous extraordinary recoveries under this mode of treatment, and says, that the same practice has also been adopted in the London house of recovery, and apparently with the most decided success; and expresses a hope, that the prejudice against the remedy will soon subside, that the publick may receive all the advantage which it is calculated to afford.

COLD AND WARM BATHING.

The observations here subjoined relative to the important subject of cold and warm bathing, selected from various respectable sources, will not be deemed superfluous.

Cold baths are those of a temperature varying from the thirty-third to the fifty-sixth degree of Fahrenheit's thermometer. The general effects, produced in a healthy person by immersion into an ordinary cold bath (that is, water of the temperature of forty-eight or fifty degrees) are, according to the accurate statement of Dr. Saunders,

as follows : " First, there is a general sensation of cold, forming that sudden shock to the whole system, which is one of the most important effects of the cold bath. This is almost immediately succeeded by an equal universal sense of warmth, which increases rapidly to a certain point, so as to cause the surrounding water, though actually cold, to feel of a comfortable warmth; and this feeling is sooner produced, and continues longer, in proportion as the person is in full health, and naturally possesses a vigorous circulation. By degrees, however, if the body continues immersed, it becomes chilled; violent shivering comes on; the extremities grow numb and pale; sometimes sickness takes place; and, at last, the animal powers are exhausted by cold and fatigue. In this process, the most remarkable effects are those which occur first, and are directly consequent to the shock of immersion; and these require particular attention in a medical view, as it is only to the production of these that the cold bathing should be suffered to proceed.

" The sensations of returning warmth which take place directly after the cold of the first immersion, constitute what has been called the *re-action of the system;* and this is certainly a proper and characteristick term, as it imports an action produced in the body itself, to resist an external impression. Re-action in this place seems to be a peculiar effort of the living power, and to be excited in a degree proportionate to the force of that power, and to the intensity of the cause which called it into action. It implies not merely an increase of the production of animal heat, but superadded to this, a sudden effort within the body, and the whole arterial system, to overcome an impression on the extremities as sudden and powerful.—Hence it is, that a mere abstraction of heat, by a cold medium, will not produce that which is precisely meant by re-action, except the external cold be applied suddenly, and to a large surface. These two conditions are fulfilled by sudden immersion into cold water. The superiour power of conducting heat, which water possesses over air, is also a circumstance that is always to be kept in mind in applying cold externally. This is particularly shown where a person continues long in this cold medium beyond the first effects of re-action. On account of the high conducting power of water, the body must be constantly employed in producing an unusual quantity of heat; and this appears to be a great effort in the consti-

tution, which, if carried too far, goes directly to destroy the animal powers." Thus three effects are produced by immersion in cold water; viz. an instantaneous and powerful shock, a sudden abstraction of heat from the surface of the body, and that exertion of the vital energies to counteract the shock and restore the lost quantity of animal heat, which is termed re-action. It is easy to perceive, that when the body is placed under such circumstances for a few seconds, a considerable impression must be made, first upon the sentient system, that is, the brain, and its ramifications, the nerves; and, secondly, upon the sanguiferous and absorbent systems: and that such impression may be rendered subservient to the prevention and cure of various diseases. It contributes in various ways to brace the human body. The relaxed fibres of the skin and the muscles acquire more solidity and compactness from contraction. Their elasticity is increased, and thus a considerable defect removed. The nerves are stimulated and excited to those powerful exertions, on which the vigour of the body so much depends. Hence the superiour advantages of cold bathing over all internal *corroborants*, its immediate salutary action being on the solids, without the intervention of the organs of digestion and nutrition. It is peculiarly adapted to those constitutions which, though robust and apparently healthy, are liable to nervous, hysterick, hypocondriacal, and paralytick, affections, as well as to frequent attacks of flatulency, and consequent indigestion. As cold bathing is a remedy, which is successfully employed for the cure of various disorders, so is it a preservative against others, and particularly against febrile infection. When used by persons in health, it increases the tone of the muscular fibre, strengthens the digestive organs, and by diminishing the sensibility of the whole system, and particularly of the skin, renders the body less susceptible of atmospherick impressions from cold, wet, and sudden changes of temperature; thus contributing to the production of what is termed a robust or athletick constitution. The duration of every cold bath applied to the whole body ought to be short; for its efficacy depends upon the sudden impression of the cold upon the skin and nerves. Much mischief is frequently done by staying in too long. It is a vulgar errour, that it is safer to enter the water when the body is cool, and that persons heated by exercise and beginning to perspire, should wait till they are perfectly

cooled. Thus plunging into it in this state they experience a sudden chilliness, that is alarming and dangerous. In such cases, the injury is generally imputed to going into the water too warm, whereas in truth it arises from going in too cool. To use the cold bath without danger, and, on the contrary, with great advantage, is to dip into the water when the heat of the body has been a little increased by exercise. In this way only is the plunge productive of a shock, without which not the smallest benefit arises from cold bathing. Healthy persons may continue in it much longer than valetudinarians; and both will be influenced by the temperature of the air, so that in summer they can enjoy it for an hour, when in spring or autumn, one or two minutes may be sufficient. The head should first come in contact with the water, either by immersion, pouring water upon it, or by the application of a wet cloth, and then diving head foremost into the water. The immersion ought to be sudden, that the first impression may be uniform all over the body; a contrary method would be dangerous; as it might propel the blood from the lower to the upper parts of the body, and thus occasion a fit of apoplexy. The best place for cold bathing is in the invigorating water of the sea, or a clear river. The morning or forenoon is the most proper time, either when the stomach is empty, or two hours after a light breakfast.—While in water the person ought to move about, in order to promote the circulation of the blood from the inner parts of the body to the extremities. After immersion the whole body ought to be rubbed dry as quick as possible, with a dry and somewhat rough cloth. Moderate exercise out of doors if convenient is advisable, and indeed necessary after bathing. If after going into the cold bath a glowing warmth pervade the whole body, we are assured of its salutary effects; but if the patient feel dull or chilly, or complain of headache or tightness across the chest, it is a proof that it disagrees, and it should accordingly be discontinued. A temperate bath (i. e. from 70° to 85° or more) is applicable to the same cases as the cold bath, and may be used in the same manner. It is preferable in many cases where the shock of the ordinary cold bath is too great. It should be remarked, that this powerful remedy is not suited to those, who have a tendency to consumption, nor to such as are constitutionally liable to bowel complaints. It should also be prohibited in cases of general plethora, or full habit

of body; in hæmorrhages, and in every kind of inflammation; in constipations, in diseases of the breast, difficult breathing, short and dry coughs, &c.; in an acrimonious or sharp state of the fluids, bad colour of the face, difficult healing of the flesh, and the scurvy, properly so called; in fits of the gout; in cutaneous diseases, and in a state of pregnancy.

Where persons cannot resort to the sea or a river, the most eligible method is by the *shower bath*, a proper apparatus for which is to be had at the tin shops; or water may be poured from a common water pot over the head and shoulders, while the person sits upon a stool, placed in a large tub; by this method considerable benefit is derived from the gravity as well as the tonick power of the water. The head and breast are secured from danger by receiving the first shock, and the water is quickly transmitted over the whole body. The temperature of the water too may be more easily modified and adapted to the circumstances of the patient. For these and other reasons the *shower bath* possesses advantages superiour to all others.

The cold bath is highly useful to preserve children from the bowel complaints, which prevail in the summer throughout the United States; and in cases of rickets it is eminently beneficial.

The warm, or *tepid bath* is about the same temperature with the blood, between ninety-six and ninety-eight degrees of Fahrenheit's thermometer. *Warm bathing* is a remedy not less efficacious than the former in diseases of an opposite nature; but concerning the operation of which, wrong notions have till very lately been entertained by the generality of medical writers and medical practitioners. It has been imagined that the warm bath relaxes and weakens, whereas it produces a contrary effect; unless indeed the temperature be so high, or the time of immersion continued so long, as to bring on that degree of debility, which is accompanied with deliquium. But this arises only from an abuse of hot bathing, and is even then the consequence of an excess of stimulation. So far is immersion of the body in water, heated to ninety-six, from having a lowering or weakening operation, that when duly regulated, it is found to raise the spirits, to mend the pulse and appetite, and to refresh and invigorate the whole frame. Hence the benefit derived from it after great fatigue; in old age: in atonick gout, accom-

panied with stiffness and pallid swellings of the joints; in paralysis; in chlorosis; in diseases arising from a certain torpor of the lymphatick and glandular system; such as scrofula, leprous, and other chronick eruptions, &c. In cases of predisposition to phthisis, it abates the frequency of the pulse, and tends to retard at least, if it does not wholly prevent, the pulmonary affection. In consequence of its soothing and agreeable impression upon the surface of the body, it produces very beneficial effects in certain disordered states of the alimentary canal, originating in diminished action; and it affords the best and speediest relief in a great variety of painful disorders, whether connected with local inflammation or not; such as chronick rheumatism, certain forms of lues venerea, nephritis, calculus vesicæ, colick, enteritis, &c. Dr. Charleton, of Bath, in England, asserts that, of nine hundred and ninety-six paralyticks, most of whom had resisted the powers of medicine, eight hundred and thirteen were benefited by the proper application of the warm bath. The time of immersion should be varied according to the temperature of the water, and the feelings of the patient. In a bath of ninety-six, a person may remain fifteen, twenty, or thirty minutes, or even longer; but in one of ninety-eight or one hundred, it will seldom be proper, and indeed there are few persons that can bear to remain beyond ten minutes, and in the generality of cases not so long. Patients labouring under chronick rheumatism and palsy, bear the high degree of temperature best. When sweating is desired, the warm bath should be used in an evening, and the patient should immediately afterwards be put into a warm bed, and remain there until late the next morning: but in all other cases, the best time for using the warm bath will be in the forenoon, about two hours after breakfast. In these cases the bathers should not retire to bed, nor confine themselves within doors, but go about as usual; unless the weather should be particularly damp or inclement. Hot bathing, like cold bathing, is applied topically by pumping on the diseased part. Sometimes steam is applied to the body instead of warm water. The warm bath is of very great utility to such individuals as are troubled with a parched and rough skin; in this and in most other cases a free use of friction with a flannel cloth, while in the water, will prove extremely beneficial.

The celebrated count Rumford has paid particular attention to the subject of warm bathing; he has examined

it by the test of experiments long and frequently repeated, and bears testimony to its excellent effects. "It is not merely on account of the advantages," says the count, "which I happened to receive from warm bathing, which renders me so much an advocate for the practice. Exclusive of the wholesomeness of the warm bath, the luxury of bathing is so great, and the tranquil state of mind and body, which follows, is so exquisitely delightful, that I think it quite impossible to recommend it too strongly, if we consider it merely as a rational and elegant refinement." "The manner, in which the warm bath operates," continues the count, "in producing its salutary consequences, seems very evident. The genial warmth, which is applied to the skin, in the place of the cold air of the atmosphere, by which we are commonly surrounded, expands all those very small vessels, where the extremities of the arteries and veins unite, and by gently stimulating the whole frame, produces a free and full circulation, which, if continued for a certain time, removes all obstructions in the vascular system, and puts all the organs into that state of regular, free, and full motion, which is essential to health, and also to that delightful repose, accompanied by a consciousness of the power of exertion, which constitutes the highest animal enjoyment of which we are capable. If this statement be correct, it cannot be difficult to explain, in a manner perfectly satisfactory, why a warm bath is often found to produce effects when first used, and especially by those who stay in the bath for too short a time, which are very different from those which it ought to produce, and which it cannot fail to produce when properly managed. We shall likewise be enabled to account for the feverish symptoms, which sometimes result from going out of a warm bath into a warm bed. The beginning of that strong circulation, which is occasioned on first going into a warm bath, is an effort of nature to remove obstructions; and, if time be not given her to complete her work, if she be checked in the midst of it, the consequences must necessarily be very different from those which would result from a more scientifick and prudent management. Hence we see how necessary it is to remain in a warm bath a sufficient time, and above all, how essential it is that the bath should be be *really warm*, and *tepid*, or what has been called temperate."—*Ree's Cyclop.*

"Dr. Marchard, resident physician of Pyrmont, has, in our opinion," says Dr. Willich, (Dom. Ency.) "satisfactorily demonstrated, that the warm bath, in many cases of debility, from spasms, pain, anxiety, and other causes, as well as to hectick and emaciated persons, is, *generally*, of eminent service, and almost the only means of restoring their health, and prolonging their lives. Instead of *heating* the human body, as has erroneously been asserted, the warm bath has a cooling effect, inasmuch as it obviously abates the quickness of the pulse, and reduces the pulsations in a remarkable degree, according to the length of time the patient continues in the water. After the body has been over-heated by fatigue from travelling, violent exercise, or from whatever cause, and likewise after great exertion or perturbation of mind, a tepid bath is excellently calculated to invigorate the whole system, while it allays those tempestuous and irregular motions, which otherwise prey upon, and at length reduce, the constitution to a sick-bed." Upon the whole, it were much to be wished that the use of the warm baths were more general among all classes of people. "Considered as a species of universal domestick remedy, as one which forms the basis of cleanliness, bathing in its different forms may be pronounced one of the most extensive, and beneficial restorers of health and vigour.

N. B. Those who are desirous of improving a fund of instruction and amusement, relative to this interesting subject, are referred to Dr. Saunders's "Treatise on Mineral Waters," "A View of the Russian Empire," &c. by the Rev. Mr. Tooke. But more especially, a truly animated and brilliant account of the use of the warm bath, to be found in M. Savery's "Letters on Egypt."

No. VII.

ON THE CULTIVATION OF THE

PAPAVER SOMNIFERUM, OR POPPY PLANT;

AND THE METHOD OF PREPARING OPIUM.

Such is the intrinsick value of opium, and such the high price which it commands, that every method, promising to

increase the quantity in the market, should be encouraged as of great importance to the community.

The citizens of the United States have not in general been apprized, that this exotick may be cultivated on our own soil to an extent adequate to every exigency, and with a profit exceeding that of many other productions of husbandry.

Opium is the inspissated juice of the papaver somniferum, or white poppy, and also of the common garden poppies of every description. From the testimony of travellers, we learn that in the several provinces of Asia, the white poppy plant attains in one season the height of from thirty to forty feet, bearing capsules weighing ten or twelve ounces, from which opium is obtained in immense quantity, by tapping them at the proper season. In England the climate and soil are not favourable to such luxuriant production, but according to the experiments of Mr. John Ball, fields cannot be sown with any thing more lucrative to the farmer, especially if those fields have a south exposure. The society for the encouragement of the arts, &c. for the year 1796, granted a premium of fifty guineas to Mr. Ball, and also a similar reward to Mr. Jones, for their exertions, and a discovery of their method of preparing opium from poppies reared in England, which proved in all respects equal in effect and superiour in purity to the best foreign opium. By a calculation, says he, which I have made, suppose one poppy to grow in one square foot of earth, and to produce only one grain of opium, more than fifty pounds will be collected from one statute acre of land. But he asserts that one poppy having twenty-eight heads, produced above thirty grains of opium. The particular species which Mr. Ball prefers as most productive, is the *double* or *semi-double*, each root of which produces from four to ten heads or pods, containing large dark coloured or variegated flowers.* The seeds of the poppy in their unripe state are very nourishing, are divested of the narcotick property of the juice, and yield on expression a mild sweet oil little inferiour to that of almonds: hence they are often employed as an article of diet, and it is customary in the east to carry a plate of them to the table after dinner with other fruit.

The attempts to cultivate this valuable plant in the

* See Annals of Medicine, 1796.

United States, have been abundantly successful, and established the important facts, that every species and variety of the plant is equally capable of producing good opium; and that the collection of it might not only become a useful, but also a lucrative employment. Dr. Shadrach Ricketson, of Dutchess county, New York, and Dr. Reynolds, of Montgomery county, Maryland, have favoured the publick with their mode of cultivation, and the result of their experiments.

The poppy seeds in this country, should be sown or planted about the middle of May, or as early in that month as the warmth of the season will admit: the soil should be moist, good, and well manured. The seeds should be planted at about ten or twelve inches distance in transverse rows, which should also be about the same distance from each other. They may be planted much thicker than is intended to allow the plants to grow, one plant in every square foot being as much as will grow advantageously. The residue should he pulled out at the first or second hoeing. The hoe must be frequently and carefully employed to keep the plants from being shaded by weeds; and when grown about four inches high, if the land be dry and not fertile, they may be frequently watered and manured. About the middle of July, the plants, in their flowering state, arrive at maturity, and yield the most juice; when commences the tapping or harvest.

The tapping ought to be commenced directly after the flower leaves begin to wither or fall from the capsules, and during a sun-shining day. If this be neglected many days, the stalk becomes dry, and no juice can be obtained. The Asiatick method of performing this operation, and which Mr. Ball adopted, is, to make several longitudinal incisions, without penetrating their cavities, first on one, and afterwards on the opposite side of the capsules, leaving the exuding juice to dry till the succeeding day, when it is to be scraped off. But it is well ascertained, that the more eligible method is, first to cut off with a sharp knife the stalk about half an inch below the capsule; then holding the capsule in one hand, take the milky juice that issues from it with a knife, and put it upon an earthen plate; by this time the top of the incised stalk will hold another large drop, which should be removed as before; this done, the stalk should be cut about an inch lower, when a similar drop of juice will issue: the cutting must be repeated as often as the milk rises upon the top. This

juice must be exposed to the sun in earthen vessels, frequently stirring it, when in a few hours the aqueous part will evaporate, and the genuine opium be formed, much stronger and more pure than any imported.

Dr. Ricketson has found by experience, that although every species of variety of the plant affords the same opium, yet a single species, and of the variety of large red or purple flowers, is deserving the preference, as growing more luxuriantly than any other, and producing from two to four stalks or heads from one seed. The capsules or heads grow particularly large, as do also the stalks; and it obvious, that in these particulars, the superiority of this variety of the plant consists. The quantity of opium that may be procured, says Dr. Ricketson, depends very much upon the largeness of the plant, and the care used in collecting it. From one poppy plant he produced seven grains of the inspissated juice.

Two species of the poppy plant were exposed to the experimental observation of the compiler of this volume the last season: the single species bearing a variegated reddish or purple flower, consisting of four leaves only, and the double or many-leaved poppy producing smaller capsules, and a flower of a pale reddish colour. The former of which proved to be incomparably the most succulent and productive. It attains to the height of from four to five feet, branching out numerous side-stalks; and more than fifty heads were counted upon one plant proceeding from a single seed. It continues to send forth capsules and flowers in succession from about the middle of July to the middle of September. Attention therefore must be paid to collecting the juice during several weeks. The method of cutting the stalk half an inch below the capsule, and repeating it as often as the juice rises upon the top, is decidedly the most eligible that can be adopted.*

From twenty plants, the spontaneous and promiscuous growth from seeds lodged in the garden during several preceding years, one hundred and ten grains of pure and strong opium were obtained. By a subsequent experiment, I have ascertained that an average number of one hundred plants will yield one ounce of pure opium. To this product however is to be added a quantity of extract

* Some of the largest heads should be reserved to mature seed for the ensuing season. We are assured that Linnæus counted in one poppy-head thirty-two thousand seeds.

which may be procured by boiling the capsules and stalks of the poppy in water, after extracting the milky juice, which if properly prepared will possess about half the power of genuine opium. The capsules recently cut, and the stalks separated from the root, are to be boiled in a large quantity of water about four hours, when the liquor should be strained off, and afterwards reduced by evaporation over a moderate fire to the consistence of extract; care should be taken at the latter part of the process to stir it frequently to prevent its being injured by burning. The seeds contained in the capsules will yield a quantity of bland oil, which being destitute of any narcotick property, should be skimmed off while floating on the surface of the liquor, lest it be incorporated with the extract, and thereby injure its strength. It is to be observed that the trouble and inconvenience in collecting the juice of the poppy is by no means inconsiderable, but when it is considered that this operation, by far the greatest part of the whole labour of the season, may be performed by women and children, and that the crop would be ready for the market and exchanged for cash in the short space of four or five months, it will be conceded, that when the price of opium exceeds ten dollars per pound, the cultivator of the poppy may anticipate a profit greatly exceeding that of the ordinary crops of Indian corn or other grain.

It is a subject of grateful reflection that in every exigency we may resort to that all bountiful source of national and individual wealth, our native soil, which with the labour of our hands, may administer to our necessities, and supersede the importation of expensive and frequently adulterated foreign productions. To the cultivators of rice in our southern states, enjoying a climate and soil, supposed to be peculiarly adapted to the growth of the poppy, it must be a very interesting inquiry, whether the culture of this plant might not be an excellent substitute for that of rice. A rich and moist soil is most congenial to the poppy; and even if the planter should not in the first instance realize an equivalent remuneration, yet the draining off stagnant water from noxious rice swamps, will annihilate one of the most fertile sources of pestilence and disease, and thereby essentially meliorate their own local condition. From experiments on a small scale, the probable issue of more extensive attempts might be predicted. Every effort, therefore, to effect an object so truly interesting and important ought to be duly encouraged and rewraded.

TABLE OF SYNONYMES OF THE MEDICINES, SIMPLE AND COMPOUND, IN THE PHARMACOPŒIAS OF LONDON, DUBLIN, AND EDINBURGH.

Edinburgh.	*Dublin.*	*London.*	*Various.*
Acidum Acetosum	Acetum vini	Acetum	
destillatum	distillatum	Acidum aceticum	
forte	Acidum aceticum		Acetum radicale
camphoratum	camphoratum		
syrupus			
Acetum aromaticum			Acetum prophylacticum
Acidum benzoicum	Acidum benzoicum	Acidum benzoicum	Flores benzoini, *or* benzoes
Acidum citricum	Acidum citricum crystallis concretum	Acidum citricum	Acidum limonum
Acidum muriaticum	Acidum muriaticum	Acidum muriaticum	Spiritus salis glauberi seu fumans
	dilutum		Spiritus salis communis acidus
Acidum oxy muriaticum	Aqua oxy-muriatica		
Acidum nitricum		Acidum nitricum	
nitrosum	Acidum nitrosum		Spiritus nitri glauberi seu fumans
dilutum	dilutum	Acidum nitricum dilutum	Aqua fortis
unguentum	unguentum		
Acidum succinicum	Acidum succinicum		
Acidum sulphuricum	Acidum sulphuricum	Acidum sulphuricum	Oleum vitrioli
dilutum	dilutum	dilutum	Spiritus vitrioli acidus
aromaticum			Elixir vitrioli aromaticum
Acipenser huso, &c.	Ichthyocolla		Colla piscium
Aconitum Napellus	Aconitum	Aconitum	Aconitum neomontanum
succus spissatus		Extractum aconiti	
Acorus calamus	Acorus	Calamus	Acorus verus
Æsculus Hippocastanum	Æsculus hippocastanum		Hippocastanum
Agrimonia Eupatoria	Agrimonia		
Æther nitrosus	Æther nitrosus		Naphtha nitri

Edinburgh.	*Dublin.*	*London.*	*Various.*
Ætheris nitrosi, spiritus	Spiritus æthereus nitrosus	Spiritus ætheris nitrici	Spiritus nitri dulcis
Æther sulphuricus	Æther sulphuricus	Æther sulphuricus	Naptha vitrioli
		Æther rectificatus	
cum alcohole	Liquor æthereus sulphuricus	Spiritus ætheris sulphurici	Spiritus vitrioli dulcis
		Oleum æthereum	Oleum vini
	Liquor æthereus oleosus	Spiritus ætheris compositus	Liquor anodynus hoffmanni
aromaticus		Spiritus ætheris aromaticus	Elixir vitrioli dulce
Alcohol	Alcohol	Alcohol	Spiritus vini rectificatissimus
Alcohol	Spiritus vinosus rectificatus	Spiritus rectificatus	
dilutum	Spiritus vinosus tenuior	Spiritus tennior	
ammoniatum	Spiritus ammoniæ	Spiritus ammoniæ	Spiritus salis ammoniaci dulcis
aromaticum	aromaticus	aromaticus	Spiritus volatilis oleosus
fœtidum	fœtidus	fœtidus	Spiritus volatilis fœtidus
		succinatus	Eau de luce
Allium cepa	Cepa		
Allium sativum	Allium	Allium	
	syrupus		
Allium porrum		Porrum	
Aloe socotorina	Aloe socotorina	Aloes spicatæ extractum	Aloe spicata, *Dub.*
hepatica	hepatica	vulgaris extractum	sinuata, *Dub.*
		Decoctum aloes compositum	
		Extractum aloes	
pilulæ	cum zingibere pilulæ	Pilulæ aloes compositæ	
et assæ fœtidæ pilulæ			Pilulæ cocciæ
cum colocynthide pilulæ	Colocynthidis pilulæ compositæ		Pilulæ rufi
et myrrhæ pilulæ	Aloes cum myrrha pilulæ	Pilulæ aloes cum myrrha	Hiera picra
	cum canella pulvis		Pilulæ aromaticæ
	cum guaiaco pulvis	Pulvis aloes compositus	ecophraticæ
tinctura	tinctura	Tinctura aloes	Essentia aloes

Aloe tinctura ætherea			Elixir proprietatis vitriolicum
Aloe et myrrhæ tinctura			Elixir proprietatis
vinum	Aloes tinctura composita	Tinctura aloes composita	Tinctura saera
	vinum	Vinum aloes	Bismalva
Althæ officinalis		Althæa	
syrupus		Syrupus althææ	
decoction			
Aluminæ sulphas	Alumen, super-sulphas argillæ alcalisatæ	Alumen, super-sulphas aluminæ et potassæ	
exsiccatus	ustum	Alumen exsiccatum.	
pulvis compositus			Pulvis stypticus
		Liquor aluminis compositus	Aqua amminosa Bateana
			Coagulum aluminosum
Amomum repens	Cardamomum minus	Cardamomum	Amomum cardamomum. *Dub.*
			Elettari cardamomum. *Lond.*
tinctura	tinctura	Tinctura cardamomi	
	composita	composita	Tinctura stomachica
zingiber	Zingiber	Zingiber	Zingiber officinale. *Lond.*
	tinctura	Tinctura zingiberis	
syrupus	syrupus	Syrupus zingiberis	
Amomum zedoaria	Zedoaria		
Ammoniacum	Ammoniacum		Heracleum gummiferum. *Lond.*
	lac	Mistura ammoniaci	
		Emplastrum ammoniaci	
	cum hydrargyro emplastrum	cum hydrargyro	Emp. ex ammoniaco cum mercurio
Ammoniæ aqua	Aqua ammoniæ causticæ	Liquor ammoniæ	Spiritus salis ammoniaci cum calce
carbonas	Carbonas ammoniæ	Ammoniæ carbonas	Sal volatilis salis ammoniaci
carbonatis aqua	Aqua carbonatis ammoniæ	Liquor ammoniæ carbonatis	Spiritus salis ammoniaci
carbonatis aqua	Liquor volatilis cornu cervi		Spiritus cornu cervi
acetitis aqua	Aqua acetatis ammoniæ	Liquor ammoniæ acetatis	Spiritus Mindereri
murias	Sal ammoniacum; murias ammoniæ	Ammoniæ murias	Ammonia muriata
	Aqua sulphureti ammoniæ		

Edinburgh.	*Dublin.*	*London.*	*Various.*
Ammoniæ hydro-sulphuretum	Hydro-sulphuretum ammoniæ		
Amygdalus communis; nucleus	Amygdalæ dulces	Amygdala amara, dulcis	
oleum	Oleum amygdalarum	Oleum amygdalæ	
		Confectio amygdalæ	
emulsio	Amygdalæ lac	Mistura amygdalæ	Emulsio communis
Amyris Gileadensis; resina liquida			Balsamum Gileadense
Amyris elemifera; resina	Elemi	Elemi	
	unguentum	Unguentum elemi compositum	Balsamus Arcæi
Anchusa tinctoria	Anchusa		
Anethum fœniculum	Fœniculum dulce	Fœniculum	
	oleum essentiale		
	aqua	Aqua fœniculi	
Anethum graveolens		Anethum	
		Aqua anethi	Aqua seminum anethi
Angelica archangelica			Angelica sativa
		Cusparia	Bonplandia. *Willd.* Cusparia febrifuga. *Lond.*
Angustura	Angustura		
	tinctura		
		Infusum cuspariæ	
Anthemis nobilis	Chamæmelum	Anthemis	
extractum	extractum	Extractum anthemidis	
		Oleum anthemidis	
		Infusum anthemidis	
decoctum	decoctum compositum	Decoctum malvæ compositum	Decoctum commune pro clystere
	Enema catharticum		
Anthemis pyrethrum	Pyrethrum	Pyrethrum	
Antimonii sulphuretum	Sulphuretum antimonii	Antimonii sulphuretum	Stibium
Antimonii sulphuretum præparatum	Sulphuretum antimonii præparatum		

Antimonii sulphuretum præcipitatum	Sulphur antimoniatum fuscum	Antim. sulphuretum præcipitatum	Sulphur aurat. antim. Kermes mineral
oxidum cum sulph. vitrif.			Vitrum antimonii
vitrificatum cum cera			Vitrum antimonii ceratum
per nitrat. potassæ			Crocus metallorum
cum phosphate calcis	Pulvis antimonialis	Pulvis antimonialis	Pulvis Jacobi
murias			Butyrum ant. Causticum ant.
	Oxydum antimonii nitro-muriaticum	Antimonii oxydum	Pulvis Algarothi
tartris	Tartarum antimoniatum	Antimonium tartarizatum	Tartarus emeticus
vinum		Liquor antimonii tartarizati	Vinum antimoniale
Apium petroselinum			
Aqua destillata	Aqua distillata	Aqua distillata	
Arbutus uva ursi	Uva ursi		
Arctium lappa	Bardana		Lappa major
Argentum	Argentum	Argentum	
nitras	Nitras argenti	Argenti nitras	Causticum lunare
Aristolochia serpentaria	Serpentaria virginiana	Serpentaria	
tinctura	tinctura	Tinctura serpentariæ	
Arnica montana	Arnica		Doronicum Germanicum
Aromaticum electuarium	Electuarium aromaticum	Confectio aromatica	Confectio cardiaca
Aromaticus pulvis	Pulvis aromaticus	Pulvis cinnamomi compositus	Species aromaticæ
Arsenici oxidum	Arsenici oxydum album	Arsenici oxydum	Arsenicum album
		præparatum	
	Arsenias kali	Liquor arsenicalis	Solutio mineralis Fowleri
Artemisia abrotanum	Abrotanum		
Artemisia Absinthium	Absinthium vulgare	Absinthium	
	extractum		
Artemisia maritima	maritimum		Semen cinæ, seu contra
Artemisia santonica	Santonicum		
Arum maculatum	Arum		Aron

Edinburgh.	*Dublin.*	*London.*	*Various.*
Asarum Europæum	Asarum	Asarum	
——— pulvis compositus	pulvis compositus		Pulvis sternutatorius
Astragalus tragacantha, gummi	Tragacantha	Tragacantha	Astriagalus verus. *Lond.*
mucilago	mucilago		
		Pulvis tragacanthæ compositus	
Atropa belladonna	Belladonna	Belladonna	Solanum lethale
succus spissatus		Extractum belladonnæ	
Avena sativa		Avena	
Barytæ carbonas			Barytes. Terra ponderosa
muriás			
solutio			
sulphas			Terra pond. vitriol Spathum pond.
Bitumen petroleum	Petroleum Barbadense	Petroleum	Oleum petræ
Boletus igniarius			Agaricus chirurgorum
Bubon galbanum	Galbanum	Galbanum	
	tinctura		
Emplastrum gummosum	emplastrum	Pilulæ galbani compositæ	Pilulæ gummosæ
Calx	Calx recens usta	Emplastrum galbani compositum	Emplastrum commune cum gummi
Calcis aqua	Aqua calcis	Calx	Calx viva
linimentum	Linimentum calcis	Liquor calcis	Aqua calcis simplex Solutio calcis
carbonas *a* creta alba	Creta, carbonas calcis		Oleum lini cum calce
aqua linimentum *b* marmos [album		Creta	
præparatus	Creta præparata	Lapis calcareus	
	præcipitata	Creta præparata	
potio	mistura	Mistura cretæ	Julepum e creta, Potio cretacea
trochisci			Tabellæ cardialgicæ
pulvis compositus		Pulvis cretæ compositus	Pulvis e bolo comp. Pulv. cretaceus

		Pulvis cretæ cum opio	Pulvis e bolo comp. cum opio
Calcis muriatis solutio	Aqua muriatis calcis		
Cancer pagurus	Cancer		
Canella alba	Canella alba	Canella alba	Costus corticosus
Capiscum annuum	Capsicum	Capsicum	
		Tinctura capsici	
Carbo ligni	Carbo ligni	Carbo ligni	
Cardamine pratensis	Cardamine	Cardamine	
Carum carui	Caruon	Carui	Carvi
spiritus	spiritus	Spiritus carui	Aqua carvi spirituosa
	oleum essentiale	Oleum carui	
		Aqua carui	
Carophyllus aromaticus	Caryophyllus aromatica	Caryophylli	Eugenia caryophyllata. *Dub. Lond.*
		Caryophylli oleum	
		Infusum caryophyllorum	
Cassia fistula	Cassia fistularis	Cassiæ pulpa	Diacassia
electuarium	electuarium	Confectio cassiæ	
senna	Senna	Senna	
tinctura composita	tinctura	Tinctura sennæ	Elixir salutis
electuarium	electuarium	Confectio sennæ	Electuarium lenitivum
extractum			
	syrupus	Syrupus sennæ	
	infusum	Infusum sennæ	Infusum sennæ commune
		Pulvis sennæ compositus	
Castor fiber ; castoreum	Castoreum rossicum	Castoreum	
tinctura	tinctura	Tinctura castorei	
composita			
	Castoreum canadense		
	tinctura		
Centaurea benedicta	Carduus benedictus		
Cera alba	Cera alba	Cera alba	Apis mellifica. *Dub.*

Edinburgh.	*Dublin.*	*London.*	*Various.*
Linimentum simplex			
Unguentum simplex	Cera unguentum		Unguentum album
Cera flava	flava	Cera flava	
	purificata		
	unguentum	Ceratum	
		Emplastrum ceræ	Emplastrum attrahens
Cervus elaphus, cornu	Cornu cervinum	Cornua	
		Cornu ustum	
	Cornu cervini decoctum	Mistura cornu usti	Decoctum album
	pulvis	Pulvis cornu usti cum opio	
	liquor volatilis		Spiritus cornu cervi
	oleum		Oleum cornu cervi fœtidum
	rectificatum		e cornubus
Chironia centaurium	Centaureum minus		
Cinara scolymus			Cinara hortensis
Cinchona caribæa			
Cinchona officinalis	Cinchona; Cortex peruvianus	Cinchona	
a communis		lancifolia	
b flavus		cordifolia	
c ruber		oblongifolia	
extractum	extractum	Extractum cinchonæ	
	rubræ extractum resinosum	resinosum	
decoctum	decoctum	Decoctum cinchonæ	Decoctum corticis peruviani
infusum	infusum sine calore	Infusum cinchona	
tinctura	tinctura	Tinctura cinchonæ	Tinctura corticis peruviani
	tinctura composita	Tinctura cinchonæ composita	Elixir antihypochondriacum
Citrus aurantium	Aurantium Hispalense	Aurantium	Mala aurantia
aqua distillata			

Citrus aurantium	Aurantium	Infusum aurantii compositum
conserva	conserva	Confectio aurantii — Conserva flavedinis cort. aur.
	tinctura	Tinctura aurantii — Tinctura corticis aurantii
syrupus	syrupus	Syrupus aurantii — Syrupus e corticibus aurantiorum
medica, fructus	Limon	Limones
aqua distillata		
syrupus	syrupus	Syrupus limonis — Syrupus e succo citriorum
Coccus cacti	Coccinella	Coccus
Cochlearia armoracia	Raphanus rusticanus	Armoracia
	spiritus compositus	Spiritus armoraciæ compositus — Aqua raphani composita
		Infusum armoraciæ compositum
officinalis	Cochlearia	
succus compositus		Succi ad scorbuticos
Cocos butyracea, oleum fixum		Oleum palmæ
Colchicum autumnale	Colchicum	Colchicum
	oxymel	
syrupus		
		Acetum colchici
Colomba	Colombo	Columba
		Infusum columbæ
tinctura	tinctura	Tinctura columbæ
Conium maculatum	Cicuta	Conium
succus spissatus	succus spissatus	Extractum conii
Convolvulus scammonia	Scammonium	Scammoneæ gummi resina — Diagrydium
pulvis compositus		Pulvis scammoneæ comp. — Pulvis comitis warwicensis
	electuarium	Confectio scammonii — Electarium caryocostinum
jalapa	Jalapa	Jalapa — Mechoacanna nigra
Convolvuli jalapæ extractum	Jalapæ extractum	Extractum jalapæ — Extractum jalapii
	resinosum	
tinctura	tinctura	Tinctura jalapæ — Tinctura jalapii
pulvis compositus		

Edinburgh.	*Dublin.*	*London.*	*Various.*
Copaifera officinalis, resina liquida	Balsamum copaibæ	Copaiba	Balsamum brasiliense
Coriandrum sativum	Coriandrum	Coriandrum	
Crocus sativus	Crocus	Croci stigmata	Crocus Anglicus
		Syrupus croci	
tinctura	tinctura		
Croton eleutheria	Cascarilla	Cascarilla	Croton cascarilla. *Dub. Lond.* Clutia eleutheria. *Linn.*
	tinctura	Tinctura cascarillæ	
	extractum resinosum		
		Infusum cascarillæ	
Cucumis colocynthis	Colocynthis	Colocynthidis pulpa	
		Extractum colocynthidis	
	extractum compositum	Extractum colocynthidis comp.	Extractum catharticum. Pil. rudii
uminum cyminum		Cuminum	
		Emplastrum cumini	Emplastrum e cymino
Cuprum	Cuprum		
subacetis	Ærugo, subacetas cupri	Ærugo	Viride æris
	præparata		
	oxymel	Linimentum æruginis	Mel Ægyptiacum
unguentum	unguentum		
ammoniaretum	Cuprum ammoniatum	Cuprum ammoniatum	Cuprum ammoniacum
pilulæ			
	aqua	Liquor cupri ammoniati	Aqua sapphirina
sulphas	Sulphas cupri	Cupri sulphas	Cuprum vitriol. Vitr. cœruleum
solutio composita			Aqua styptica
Daphne mezereum	Mezereon	Mezereum	Laureola; cocognidium
Daphnes mezerei decoctum			
Datura stramonium	Stramonium		
Daucus carota	Daucus sylvestris	Daucus	Carota

Delphinium staphisagria	Staphisagria	Staphisagria	
Dianthus caryophyllus	Caryophyllum rubrum		Caryophylla rubra
syrupus	syrupus		
Digitalis purpurea	Digitalis	Digitalis	
	decoctum		
tinctura	tinctura	Tinctura digitalis	
infusum			
Dolichos pruriens	Dolichos	Dolichos	
Dorstenia contrajerva		Contrajerva	
		Pulvis contrajervæ comp.	Lapis contrayervæ
Eryngium maritimum	Eryngium		
Euphorbii officinalis gummi resina		Euphorbium	
Ferrum	Ferrum		
limatura purificata			Chalybs
			Ferrum alcoholisatum
carbonas præparatus	Rubigo ferri		Chalybis rubigo præparata
præcipitatus	Carbonas ferri	Ferri carbonas	
		Mistura ferri composita	Mistura myrrhæ Griffiths
		Pilulæ ferri cum myrrha	
oxidum nigrum purificatum	Oxydum ferri nigrum		Squamæ ferri purificatæ
sulphas	Sulphas ferri	Ferri sulphas	Sal martis, vitr. viride. Sal chalybis
exsiccatus	exsiccatum		Vitriolum calcinatum
oxidum rubrum	Oxydum ferri rubrum		Colcothar vitrioli
emplastrum	Emplastrum thuris		Emplastrum roborans
muriatis tinctura	Tinctura muriatis ferri	Tinctura ferri muriatis	Tinctura martis in spiritu salis
cum oxydo rubro			Tinctura martis aurea.
et ammoniæ murias	Murias ammoniæ et ferri	Ferrum ammoniatum	Flores martiales
		Tinctura ferri ammoniati	Tinctura florum martialum
	Tartarum ferri	Ferrum tartarizatum	Mars solubilis. Tartarus martialis
	Vinum ferri	Vinum ferri	Vinum chalybeatum. Vin. martis
	Acetas ferri		Extractum martis
	Tinctura acetatis ferri		

Edinburgh.	*Dublin.*	*London.*	*Various.*
	Tinctura acetatis ferri cum alcohol		
	Sulphuretum ferri		
		Liquor ferri alkalini	
Ferula assa fœtida	Assa fœtida	Assæfœtidæ gummi resina	
	lac	Mistura assafœtidæ	
tinctura	tinctura	Tinctura assafœtidæ	Tinctura fœtida
	Enema fœtidum		
pilulæ compositæ	Pilulæ myrrhæ compositæ		Pilulæ gummosæ
emplastrum			Emp. antihystericum
Ficus carica	Carica	Carica	
Fucus vesiculosus	Quercus marina	Fucus	
	pulvis	Manna	
Fraxinus ornus; manna	Manna		Æthiops vegetabilis
Gambogia	Gambogia	Cambogia	Manna calabrina
		Pilulæ gambogiæ comp.	{ Stalagmitis gambogioides. *L.D.*
Gentiana lutea	Gentiana	Gentiana	{ Gummi guttæ
extractum	extractum	Extractum gentianæ	Gentiana rubra
infusum	infusum compositum	Infusum gentianæ comp.	Infusum amarum simplex
tinctura composita	tinctura composita	Tinctura gentianæ comp.	Tinctura amara, Elixir stomachicum
vinum compositum			Vinum amarum
Geoffræa inermis	Geoffræa		Geoffroya inermis. *Dub.*
decoctum			
Geum urbanum	Geum urbanum		Caryophyllata
Glycyrrhiza glabra	Glycyrrhiza	Glycyrrhiza	Radix liquiritiæ
extractum	extractum	Extractum glycyrrhizæ	Succus liquiritiæ depuratus
Glycyrrhizæ glabræ trochisci			Trochisci becchici nigri
cum opio			
Gratiola officinalis	Gratiola		

Guaiacum officinale	Guaiacum	Guaiacum	Lignum sanctum
tinctura	tinctura	Tinctura guaiaci	Elixir guaiacinum
ammoniata	ammoniata	ammoniata	Elixir guaiacinum volatile
decoctum compositum	Aqua calcis compositum		Decoctum lignorum
		Mistura guaiaci	Lac guaiaci
Hæmatoxylum campechianum	Hæmatoxylum	Hæmatoxylon	Lignum Campechense
extractum	extractum	Extractum hæmatoxyli	Extractum ligni Campechensis
Helleborus niger	Helleborus niger; melampodium	Helleborus niger	Melampodium
extractum	extractum		Extractum melampodii
tinctura	tinctura	Tinctura hellebori nigri	Tinctura melampodii
Helleborus fœtidus	Helleboraster	Helleborus fœtidus	
Hirudo medicinalis	Hirudo medicinalis		
Hordeum distichon	Hordeum distichum	Hordeum	
decoctum	decoctum	Decoctum hordei	Aqua hordeata
	compositum	compositum	Decoctum pectorale
		Cerevisiæ fermentum	
		Cataplasma fermenti	
Humulus lupulus		Humulus	
		Extractum humuli	Extractum lupuli
		Tinctura humuli	
Hydrargyrus	Hydrargyrum	Hydrargyrus	Argentum vivum; Mercurius
purificatus	purificatum	purificatus	
pilulæ	pilulæ	Pilulæ hydrargyri	Pilulæ cœruleæ
Hydrargyri emplastrum		Emplastrum hydrargyri	Emplastrum hydrargyri cum hydrarg.
unguentum	Hydrargyri unguentum	Unguentum hydrargyri fortius	Unguentum cæruleum fortius
	mitius	mitius	mitius
		Linimentum hydrargyri	
	Hydrargyrum cum magnesia		
	creta	Hydrargyrus cum creta	Mercurius alkalisatus
Hydrargyri acetis	Acetas hydrargyri		
murias	Murias hydrargyri corrosivum	Hydrargyri oxymurias	Mercurius corrosivus sublimatus

Edinburgh.	*Dublin.*	*London.*	*Various.*
		Liquor hydrargyri oxymuriatis	Liquor bellostii
Hydrargyri sub-murias	Sub-murias hydrargyri sublimatum	Hydrargyri sub-murias	Calomelas. Panacea merc.
		Pilulæ hydrargyri sub-muriatis	Pilulæ plummeri
præcipitatus	præcipitatum		præcipitatus dulcis
	ammoniatum	Hydrargyrus præcipitatus albus	Mercurius cosmeticus
	unguentum		Unguent. e mercurio præcip.
oxidum cinereum	Pulvis hydrargyri cinereus	Hydrargyri oxydum cinereum	Mercurius solubilis
unguentum			
	Oxydum hydrargyri	oxydum rubrum	Mercurius calcinatus
oxidum rubrum per acidum nitricum	nitricum	nitrico-oxydum	præcipitatus ruber
rubri unguentum	Sub-nitratis hydrargyri unguentum	Unguentum hydrargyri nitr. oxydi	
nitratis ung. fortius	Super-nitratis hydrargyri unguent.	nitratis	Unguentum citrinum
ung. mitius			
sub-sulphas flavus	Oxydum hydrargyri sulphuricum		Turpethum miner. Merc.emet.flav.
sulphuretum nigrum	Sulphuretum hydrargyri nigrum		Æthiops mineralis; Pulv. hypnot.
sulphuretum rubrum	hydrargyri rubrum	Hydrargyri sulphuretum rubrum	Cinnabaris factitia
Hyosciamus niger	Hyosciamus	Hyosciamus	
succus spissatus	succus spissatus	Extractum hyosciami	
tinctura	tinctura	Tinctura hyosciami	
Hyssopus officinalis	Hyssopus		
Inula helenium	Enula campana		
Ipecacuanha	Ipecacuanha	Ipecacuanha	Callicocca, *or* cephaelis ipecacuanha
Ipecacuanhæ et opii pulvis	Ipecacuanhæ pulvis compositus	Pulvis ipecacuanhæ comp.	Pulvis Doveri
vinum	vinum	Vinum ipecacuanhæ	
Iris Florentina			
Juniperus communis	Juniperus	Juniperus	
Juniperi spiritus compositus	Juniperi spiritus compositus	Spiritus juniperi compositus	Aqua juniperi composita
oleum volatile	oleum essentiale	Oleum juniperi	

Juniperus lycia, resina	Olibanum	Olibanum	Thus
sabina	Sabina	Sabina	
oleum volatile	oleum essentiale		
	extractum		
	unguentum		
Kino	Kino		
tinctura	tinctura		
		Ceratum sabinæ	
		Kino	{ Eucalyptus resinifera, *Ed.*;
		Tinctura kino	{ Butea frondosa, *Dub.*
		Pulvis kino comp.	
Lactuca virosa			Lactuca sylvestris
succus spissatus			
Lavandula spica	Lavandula	Lavandula	
spiritus	spiritus	Spiritus lavandulæ	Spiritus lavend. simp.
compositus	compositus	compositus	
oleum volatile	oleum essentiale	Oleum lavandulæ	Oleum spicæ
Laurus camphora; camphora	Camphora	Camphora	
Tinctura camphoræ	Spiritus camphoratus	Spiritus camphoræ	Spiritus vinosus camphoratus
Emulsio camphorata	Mistura camphorata	Mistura camphoræ	Julepum e camphora
Oleum camphoratum	Oleum camphoratum	Linimentum camphoræ	
		comp.	Linimentum camphoræ
Laurus cassia	Cassia lignea		Xylocassia. Can. Malab.
aqua destillata			
Laurus cinnamomum	Cinnamomum	Cinnamomum	Cannella
aqua destillata	aqua	Aqua cinnamomi	Aqua cinnamomi simplex
		oleum	
spiritus	spiritus	Spiritus cinnamomi	Aqua cinnamomi spirituosa
tinctura	tinctura	Tinctura cinnamomi	
composita	composita	composita	Tinctura aromatica
Laurus nobilis		Laurus	
sassafras	Sassafras	Sassafras	
oleum volatile	oleum essentiale		
Leontodon taraxacum	Taraxacum	Taraxacum	Dens leonis

Edinburgh.	*Dublin.*	*London.*	*Various.*
	Taraxacum extractum	Extractum taraxaci	
Licken Islandicus	Linchen islandicus	Lichen	Muscus Islandicus
	decoctum	Decoctum lichenis	
Lichen rocella	Litimus		Lacmus tinctorius
Linum usitatissimum	Linum	Linum usitatissimum	
oleum	oleum	Oleum lini	
		Infusum lini	
Linum catharticum	Linum catharticum	Linum catharticum	
Lobelia syphilitica			
Lythrum salicaria	Lythrum salicaria		
Magnesia	Magnesia usta	Magnesia	
carbonas	Magnesia	Magnesiæ carbonas	Sal catharticum amarum
sulphas	Sulphas magnesiæ	sulphas	Magnesia vitriariorum
Malva silvestris		Malva	
Manganesium	Maganesium		
Mel	Mel	Mel	
	despumatum	despumatum	
	Oxymel	Oxymel	Oxymel simplex
Marrubium vulgare	Marrubium album	Marrubium	
Melaleuca leucadendron, oleum	Oleum cajeput	Cajuputi oleum	Melaleuca cajuputi. *Lond.*
Melissa officinalis			
Meloe vesicatorius	Cantharis	Lytta	Lytta vesicatoria. *Lond.*
tinctura	tinctura	Tinctura lyttæ	
pulveris unguent.	unguentum	Ceratum lyttæ	Unguentum epispasticum fortius mitius
infusi unguentum			
emplastrum	Cantharidis emplastrum	Emplastrum lyttæ	Emplastrum vesicatorium
Meloes vesicatorii emplast. comp.	Emplastrum calefaciens		

Mentha piperita	Mentha piperitis	Mentha piperita var. *a.*	
aqua destillata	aqua	Aqua menthæ piperitæ	Aqua menth. pip. simplex
spiritus		Spiritus menthæ piperitæ	spirituosa
oleum volatile	oleum essentiale	Oleum menthæ piperitæ	
pulegium	Pulegium	Pulegium	
aqua destillata	aqua	Aqua pulegii	
	oleum essentiale	Oleum pulegii	
		Spiritus pulegii	
Mentha viridis	Mentha sativa	Mentha viridis	
	oleum essentiale	Oleum menthæ viridis	
	aqua	Aqua menthæ viridis	Aqua menthæ vulgaris simplex
		Spiritus menthæ viridis	spirituosa
	infusum compositum		
Menyanthes trifoliata	Trifolium paludosum	Menyanthes	Trifolium palustre
Mimosa catechu, extractum	Catechu	Catechu extractum	Acacia catechu. *L.* Terra Japonica
electuarium	electuarium compositum		Confectio Japonica
tinctura	tinctura		Tinctura Japonica
infusum		Infusum catechu	Infusum Japonicum
nilotica, gummi	Gummi arabicum	Acaciæ gummi	Acacia vera. *L.* Gummi Senegal
mucilago	mucilago	Mucilago acaciæ	
emulsio	Emulsio arabica		
Momordica elaterium	Cucumis agrestis	Elaterii poma	
succus spissatus	Elaterium	Extractum elaterii	
Morus Nigra		Morus	
		Syrupus mori	
Moschus moschiferus; Moschus	Moschus	Moschus	
	tinctura		
		Mistura moschi	Julepum e moscho
Myristica moschata; Nux moschata	Nux moschata	Myristicæ nuclei	
spiritus	spiritus	Spiritus myristicæ	Aqua nucis moschatæ spirituosa
Myroxylon Peruiferum; Balsamum	Balsamum Peruvianum	Balsamum Peruvianum	Balsamum Indicum nigrum

Edinburgh.	*Dublin.*	*London.*	*Various.*
Myrrha	Myrrha	Myrrha	
tintura	tinctura	Tinctura myrrhæ	
Myrtus pimenta	Pimento; Piper Jamaicense	Pimentæ baccæ	Piper Jamaicense
aqua destillata	aqua	Aqua pimentæ	Aqua pimentæ spirituosa
spiritus	spiritus	Spiritus pimentæ	
oleum volatile	oleum essentiale	Oleum pimentæ	
Nicotiana tabacum	Nicotiana	Tabacum	
vinum			
		Infusum tabaci	
Olea Europæa; oleum	Oleum olivarum	Olivæ oleum	
Oleum ammoniatum	Ammoniæ linimentum	Linimentum ammoniæ fortius	
		carbonatis	Linimentum volatile
Oleum sulphuratum		Oleum sulphuratum	Balsamum sulphuris crassum
Oniscus asellus	Millepedæ		
Opium	Opium	Opium	
	extractum aquosum	Extractum opii	Extract. thebaicum. Opium colatum
	purificatum		
tinctura	tinctura	Tinctura opii	Tinctura thebaica. Laudan. liquidum
ammoniata			Elixir paregoricum. *Ed.*
	tinctura camphorata	camphoræ composita	paregoricum *Lond. Dub.*
	syrupus		
		Emplastrum opii	
		Vinum opii	Laudanum liquidum Sydenhami
		Confectio opii	Philonium Londinense
Electuarium opiatum			
Pilulæ opiatæ	Pilulæ e styrace	Pilulæ saponis cum opio	Pilulæ thebaicæ
Pulvis opiatus			
Origanum majorana	Majorana		
Origanum vulgare	Origanum	Origanum	

	Origanum oleum essentiale	Oleum origani	
Ostrea edulis		Ostrea	
	Ostrearum testæ præparatæ	Testæ præparatæ	
Oxalis acetosella		Acetosella	Lujula
Ovis aries ; sevum	Sevum ovillum	Sevum	
		Sevum præparatum	
Papaver somniferum	Papaver album	Papaveris capsulæ	
extractum		Extractum papaveris	
syrupus	syrupus	Syrupus papaveris	Syrupus diacodion ; Syr. e meconio
		Decoctum papaveris	
Papaver rhocas	Papaver erraticum	Rhœados petala	
	syrupus	Syrupus rhœados	
Pastinaca opoponax ; gummi resina		Opoponax	
Phasianus gallus		Ovum	
	Ovorum testæ præparatæ		
Pimpinella anisum	Anisum	Anisum	
oleum volatile	oleum essentiale	Oleum anisi	
	spiritus compositus	Spiritus anisi	
Pinus abies, resina aponte concreta	Pix Burgundica	Pix arida	
		Picis aridæ unguentum	Unguentum basilicum nigrum
	Emplastrum aromaticum	Emplastrum picis compositum	Emplastrum cephalicum
		Abietis resina	Thus
balsamea, resina liquida	Balsamum Canadense	Terebinthina canadensis	
larix, resina liquida	Terebinthina Veneta		
sylvestris, resina empyreum.	Pix liquida	Pix liquida	
Picis unguentum	unguentum	Picis liquidæ unguentum	
	Picis liquidæ aqua		
	Terebinthina vulgaris	Terebinthina vulgaris	
		Linimentum terebinthinæ	
		Terebinthinæ oleum	
Pini oleum volatile	Oleum terebinthinæ		
purissimum	rectificatum	Oleum terebinthinæ rectificatum	Oleum tereb. æthereum

Edinburgh.	*Dublin.*	*London.*	*Various.*
Pini resina	Resina flava ; resina alba	Resina flava	Resina alba, *Edin.* Colophonium
Emplastrum simplex		Emplastrum ceræ	Emp. cereum. Cerat. citrin.
Unguentum resinosum	Unguentum resinæ albæ	Ceratum resinæ	Ungt. basilicum flavum
Emplastrum resinosum	Litharg. emp. cum resina	Emplastrum resinæ	Emplastrum adhæsivum
Piper longum	Piper longum	Piper longum	
nigrum	nigrum	nigrum	
	unguentum		
Pistacia terebinthus		Terebinthina Chia	
Pistacia lentiscus, resina		Mastiche	
Plumbum			
oxidum album	Cerussa ; sub-acetas plumbi.	Plumbi carbonas	Sub-carbonas plumbi.
unguentum	sive sub-acetatis plumbi unguentum		Unguentum album
oxidum semi-vitreum	Lythargyrum	Plumbi oxydum semi-vitreum	Plumbum ustum
emplastrum	Lithargyri emplastrum	Emplastrum plumbi	Diachylon simplex
	Liquor sub-acetatis lithargyri	Liquor plumbi acetatis	Extractum saturni
		diluitus	
		Ceratum plumbi comp.	
	Lithargyri sub acetatis liquor comp.		
acetis	Acetas plumbi	Plumbi super-acetas	Saccharum saturni
acetetitis unguentum	Acetitis plumbi unguentum	Ceratum plumbi super-acetatis	Unguentum saturninum
oxidum rubrum			Plumbum ustum rubrum
Polyala senega	Seneka	Senega	
decoctum		Decoctum senegæ	
Polygonum bistorta	Bistorta	Bistorta	
Polypodium filix mas	Filix mas	Filix	Aspidium filix mas. *Lond.*
Potassa	Kali causticum	Potassa fusa	Alkali vegetabile fixum causticum
cum calce	cum calce	cum calce	Causticum commune mitius
aqua	aqua	Liquor potassæ	Lixivium saponarium causticum

Potassa carbonas	Kali sub-carbonas	Potassæ subcarbonas	Sal absinthii
purissimus	e tartaro	ex tartaro	tartari
impurus	Cineres clavellati ; kali impurum	Potassa impura	Lixiva, Alk. fix. veget.
	Aqua sub-carbonatis kali	Liquor potassæ subcarbonatis	Lixivium tartari
super-carbonatis aqua		Potassæ carbonas	
acetis	Kali acetas	acetas	Sal diureticus
sulphas	sulphas	sulphas	de duobus. Arcanum duplicatum
cum sulphure			polychrestus glaseri
sulphuretum	sulphuretum	supersulphas	Hepar sulphuris
	aqua	sulphuretum	
tartris	tartaras	tartras	Tartarum solub.
et sodæ tartris	Tartaras sodæ et kali	Soda tartarizata	Sal rupellensis. Sal polych. seignette
super-tartris	Chrystalli tartari	Potassæ supertartras	Tartarus purificatus
impurus	Tartarum	Tartarum	crudus
nitras	Nitrum, nitras kali	nitras	Nitrum prismaticum
trochisci			
	Aqua alcalina oxymuriatica		Aqua oxymuriatis potassæ
Prunus domestica	Prunus Gallica	Pruna (drupa siccata)	
Pterocarpus draco, resina			Sanguis draconis
santalinus	Santalum rubrum	Pterocarpi lignum	
Punica granatum	Granatum	Granatum	Balaustium
Pyrus cydonia		Cydoniæ semem	Cotonea
		Decoctum cydoniæ	Mucilago cydoniorum
Quassia excelsa	Quassia	Quassia	
	tinctura	Infusum quassiæ	

Edinburgh.	*Dublin.*	*London.*	*Various.*
Quassia simaruba	Simarouba	Simarouba	
		Infusum simaroubæ	
Quercus cerris, cyniphis nidus	Gallæ	Gallæ	Cynipidum nidi, Cynips quercus folii
	tinctura		
robur	Quercus	Quercus	Quercus pedunculata. *Lond.*
	extractum	Decoctum quercus	
Rhamnus catharticus	Rhamnus catharticus	Rhamnus	Spina cervina
syrupus		Syrupus rhamni	Syrupus domesticus
Rheum palmatum	Rheum	Rheum	Rhabarbarum
tinctura	tinctura	Tinctura rhei	Tinctura rhabarbari spirituosa
et aloes tinctura			Elixir sacrum
et gentianæ tinctura			Tinctura rhœi amara
infusum		Infusum rhei	
vinum			rhabarbari vinosa
pilulæ compositæ			Pilulæ stomachicæ
		Extractum rhei	
Rheum undulatum	Rheum undulatum	Tinctura rhei composita	Extractum rhei aquosum
Rhododendron chrysanthum			
Rhus toxicodendron		Toxicodendron	Toxicodendron
Ricinus communis	Ricinus	Ricinus	Palma christi. Cataputia major
		Oleum ricini	Oleum de kerva. Ol. palmæ liquidum
Rosa canina		Rosa canina	Cynosbatus
conserva		Confectio rosæ caninæ	Conserva fructus cynosbati
centifolia	Rosa damascena	Rosa centifolia	Rosa pallida
aqua destillata	aqua	Aqua rosæ	
syrupus		Syrupus rosæ	Syrupus rosarum solutivus
Gallica	rubra	Rosa Gallica	

Rosa Gallica conserva	Rosa mel
infusum	conserva
syrupus	infusum
Rosmarinus officinalis	Rosmarinus
spiritus	spiritus
oleum volatile	oleum essentiale
Rubia tinctorum	Rubia
Rumex aquaticus	Rumex aquaticus
acetosa	
Ruta graveolens	Ruta
extractum	extractum
	oleum essentiale
Saccharum officinarum	Saccharum
Syrupus simplex	Syrupus simplex
Sagapenum	Sagapenum
Salix alba	Salix
fragilis	fragilis
caprea	
Salvia officinalis	Salvia
Sambucus nigra	Sambucus
	unguentum
succus spissatus	succus spissatus
Sapo albus Hispanus	Sapo durus Hispanicus
tinctura	Saponis linimentum
et opii tinctura	
Emplastrum saponaceum	emplastrum
Scilla maritima	Scilla

Mel rosæ	Mel rosaceum
Confectio rosæ gallicæ	
Infusum rosæ	Tinctura rosarum
Rosmarinus	
Spiritus rosmarini	
Oleum rosmarini	
Rubia	Britannica ; Hydolapathum
Acetosa	
	Oleum rutæ æthereum
Confectio rutæ	Electarium e baccis laur
Saccharum	
Syrupus	Syrupus communis
Sagapenum	Serapinum
Salix caprea	
	Herba salviæ minoris
Sambucus	
unguentum	
	Roob baccarum sambuci
Sapo durus	Sapo ex olivæ oleo et soda confectus
Ceratum saponis	
Linimentum saponis compositum	Balsamum saponaceum
	anodynum
Emplastrum saponis	Emplastrum e sapone
Sapo mollis	Sapo ex oleo et potassa confectus
Scilla	Squilla

Edinburgh.	*Dublin.*	*London.*	*Various.*
			Scilla præparata
Scilla maritima exsiccata	Scillæ pulvis		
acetum	acetum	Acetum scillæ	Acetum scilliticum
syrupus	oxymel	Oxymel scillæ	Oxymel scilliticum
	tinctura	Tinctura scillæ	Essentia squillæ
Pilulæ scilliticæ	cum zingibere pilulæ	Pilulæ scillæ comp.	
Scrophularia nodosa	Scrophularia		
Sium nodiflorum	Sium		
Sinapis alba	Sinapi	Sinapis	Sinapis nigra
	cataplasma	Cataplasma sinapis	Sinapismus
Sisymbrium nasturtium			Nasturtium aquaticum
Smilax sarsaparilla	Sarsaparilla	Sarsaparilla	
decoctum	decoctum	Decoctum sarsaparillæ	
	compositum	compositum	
		Extractum sarsaparillæ	
Sodæ carbonas impurus	Barilla, soda impura	Soda impura	Natron impurum
carbonas	Sodæ carbonas	Sodæ subcarbonas	Sal sodæ. Alcali minerale aëratum
	siccatum	subcarbonas exsiccata	
super carbonatis aqua		carbonas	
phosphas	phosphas		
sulphas	sulphas	sulphas	Sal catharticus Glauberi
murias	Sal commune ; murias sodæ	murias	Muria ; sal commune
boras	Murias sodæ siccatum		
	Borax, sub-boras sodæ	boras	Sub-boras sodæ. *Lond. Syn.*
		Mel boracis	
Solanum dulcamara	Dulcamara	Dulcamara	Solanum scandens
		Decoctum dulcamaræ	
Solidago virga aurea	Virga aurea		
Spartium scoparium	Genista	Spartium	
	extractum		

Spigelia Marilandica	Spigelia	Spigelia	
Spermaceti	Spermaceti	Cetaceum	Physeter macrocephalus
	Sperinatis ceti unguentum	Unguentum cetacei	Linimentum album
Ceratum Simplex			Ceratum album
Spongia officinalis	Spongia	Spongia	
	ustæ pulvis	usta	
Stannum	Stannum	Stannum	
	pulvis		
Styrax Benzoin; Balsamum	Benzoe	Benzoinum	Assa dulcis
tinctura composita	tinctura composita	Tinctura benzoini composita	Balsamum traumaticum
officinalis; Balsamum	Styrax calamita	Styracis balsamum	
	purificata		
Succinum	Succinum	Succinum	Electrum, carabe
oleum	oleum	Oleum succini	
purissimum	rectificatum		
Sulphur			
Sulphur sublimatum	Sulphur sublimatum	Sulphur	
lotum	lotum	sublimatum	
		lotum	
		præcipitatum	
Sulphur unguentum	Sulphur unguentum	Sulphuris unguentum composit.	Unguentum antipsoricum
Sus scrofa, adeps	Adeps suillus	Adeps	
	præparatus	præparata	
Swietenia febrifuga	Swietenia febrifuga		
mahagoni			
Tamarindus Indica	Tamarindus	Tamarindus	
infusum, cum senna	Infusum sennæ cum tamarindis		
Tanacetum vulgare	Tanacetum		
Teucrium chamædrys	Chamædrys		
marum	Marum syriacum		
Toluifera balsamum; Balsamum	Balsamum Tolutanum	Balsamum Tolutanum	Balsamum de Carthagena

Edinburgh.	*Dublin.*	*London.*	*Various.*
Toluifera tinctura	Balsamum tinctura		
syrupus		Syrupus Tolutanus	Syrupus balsamicus
Tormentilla erecta	Tormentilla	Tormentilla	Tormentilla officinalis. *Lond.*
Triticum hybernum			
Amylum	Amylum	Amylium	
Mucilago amyli	Mucilago amyli	Mucilago amyli	
Trochisci gummosi			Trosclisci bechici albi
		Farina	
Tussilago farfara	Tussilago	Tussilago	
Valeriana officinalis	Valeriana	Valeriana	
	tinctura	Tinctura valerianæ	
	ammoniata	ammoniata	Tinctura valerianæ volat.
	extractum		
	infusum		
Veratrum album	Helleborus albus	Veratrum	
	unguentum	Decoctum veratri	
		Veratri unguentum	
tinctura			
Veronica beccabunga	Beccabunga		
		Vinum (sherry)	
Vinum album Hispanum	Viola	Viola	Viola martialis
Viola odorata	syrupus		
syrupus			
Vitis vinifera	Uvæ passæ sole siccatæ	Uvæ passæ	
Ulmus campestris	Ulmus	Ulmus	
	decoctum	Decoctum ulmi	
			Winteranus cortex
Wintera aromatica			
Zincum	Zincum	Zincum	
oxidum	Oxydum zinci	Zinci oxidum	Flores zinci
unguentum	unguentum	unguentum	

Zincum oxidum impurum	Tutia		
imp. præparatum			
unguentum	Unguentum tutiæ		
carbonas impurus	Calaminaris	Calamina	Cadmia fossilis
præparatus	Lapis calaminaris præparatus	præparata	
ceratum	unguentum	Ceratum calaminæ	Ceratum epuloticum
sulphas	Sulphas zinci	Zinci sulphas	Sal vitrioli ; Chalcanthum album
solutio			Aqua vitriolica
acetitis solutio	Tinctura acetatis zinci		

Note.—The articles in italicks in the first column are the scientifick names of articles not in the Edinburgh Pharmacopœia.

TABLE

SHOWING THE PROPORTION OF ANTIMONY, OPIUM, AND QUICKSILVER, CONTAINED IN SOME COMPOUND MEDICINES.

TARTRITE OF ANTIMONY.

Wine of tartrite of antimony contains two grains of tartrite of antimony in the ounce.

OPIUM.

Opiate electuary contains in each drachm about a grain and a half of opium.

Electuary of catechu contains in each ounce about two grains and a half of opium; for one grain of opium is contained in one hundred and ninety-three grains.

Powder of ipecacuan and opium contains six grains of opium in each drachm, or one grain in ten.

Opiate Powder contains one grain of opium in ten.

Opiate pills contain six grains of opium in each drachm, or five grains contain half a grain of opium.

Tincture of opium is made with two scruples of opium in each ounce of the liquid, or with five grains in each drachm. But a drachm of the tincture appears, by evaporation, to contain about three grains and a half of opium.

Ammoniated tincture of opium is made with about eight grains of opium in each ounce of the liquid, or with about one grain in the drachm.

Tincture of soap with opium is made with about fifteen grains of opium in each ounce of the liquid.

Troches of liquorice with opium contain about one grain of opium in each drachm.

Camphorated tincture of opium contains nearly one grain of opium in three drachms.

QUICKSILVER.

Quicksilver pills contain fifteen grains of quicksilver in each drachm. Each pill contains one grain of quicksilver.

Quicksilver ointment contains about twenty-five grains of quicksilver in each drachm.

Mild quicksilver ointment contains twelve grains of quicksilver in each drachm.

Quicksilver plaster contains about sixteen grains of quicksilver in each drachm.

Ointment of nitrate of quicksilver contains in each drachm four grains of quicksilver and eight of nitrous acid.

Milder ointment of nitrate of quicksilver contains in each scruple half a grain of quicksilver, and one grain of nitrous acid.

Ointment of the sub-muriate of quicksilver and ammonia contains in each drachm about four and a half grains of the oxide.

ENGLISH INDEX.

The following index is greatly amplified by the insertion of the different trivial or common names of each substance or compound, the systematick names being contained in the Latin index. By such arrangement the reader may with facility detect the article searched for, under the term most familiar to himself, and having turned to the page, its synonymy will be presented to his view.

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